Vol. X JUNE, 1920 No. 6

AMERICAN JOURNAL OF PUBLIC HEALTH

THE JOURNAL *of the* AMERICAN PUBLIC HEALTH ASSOCIATION

IN THE JUNE JOURNAL

Dr. Meyer tells about Community Medicine

Mr. Loomis outlines Plans of Canners to Improve their Products

Dr. Carter and Mr. Stromquist discuss Malaria Control

Mr. Fair suggests Standards for Bathing Pools

See other valuable Articles and the Notes Section.

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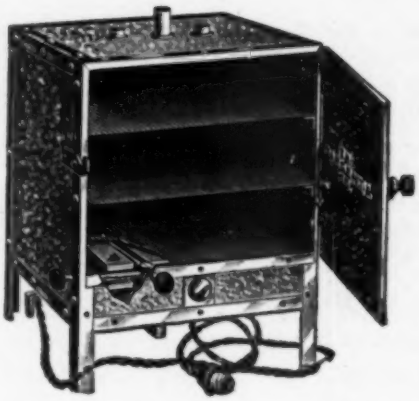

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COMMUNITY MEDICINE AND PUBLIC HEALTH

ERNST CHRISTOPHER MEYER, PH. D.,

Director of Surveys and Exhibits, International Health Board of the Rockefeller Foundation, New York City

Read before Public Health Administration Section, American Public Health Association, at New Orleans, La., October 29, 1919.

Only the rich and the poor get adequate medical attention today; the middle class are, to a large extent, less fortunate. In this the medical organization of the country has failed to accomplish its purpose. Dr. Meyer suggests lower cost of medical service through better administration and community medicine or pay clinics.

THE United States is abundantly supplied with physicians. On an average there is one doctor for every 750 citizens. England and France are less than half, and Germany and Austria were less than a third as plentifully supplied. Rural regions of the United States, of course, have fewer physicians than the cities. Their supply approximates the ratios just referred to for European countries.

PREVALENCE OF SICKNESS

Something is known, fortunately, concerning the extent of sickness, though the surface of this vital matter has hardly been scratched. The important investigations here are the sickness censuses taken by the Metropolitan Life Insurance Company, under the direction of Doctors Lee K. Frankel and Louis I. Dublin; the New York City Department of Health, under the supervision of Doctors William H. Guilfoy and Shirley W. Wynne; the State Charities Aid Association, under the guidance of Dr. J. J. Weber; the Framingham Community Health and Tuberculosis Demonstration, under the management of Dr. Donald B. Armstrong; the report on "Disabling Sickness among the Population of Seven Cotton Mill Villages of South Carolina in Relation to Family Income," by Doctors Edgar Sydenstricker, G. A. Wheeler and Joseph Goldberger, of the Public Health Service; the report on disability by age and occupation by Dr. Boris Emmet in "Modern Medicine," September, 1919.*

These censuses included 16,717 cases of sickness among more than 715,000 people. The first mentioned census alone covered over 13,000 cases of sickness in a population of 630,000, which were distributed among seven states. By "sick-

* This report is being issued officially by the United States Bureau of Labor Statistics.

ness" was understood "an illness so serious that it either necessitated or should have necessitated the patient's going to bed or securing medical aid." The censuses also determined the proportion of the sick who were disabled, i. e., too ill to work. The sickness rate was found to be about 22 per thousand; the disability rate about 18 per thousand. The population of the United States in 1918 was roughly 105,000,000. At any one time, assuming a sickness rate of about 25 per thousand among the population as a whole,† there are hence some 2,600,000 persons sick. The average duration of cases of sickness from onset of sickness to date of the census is about seven days.‡ The 365 days of the year may hence be divided into about 52 successive periods of sickness. On this basis we have in this country annually about 135,850,000 cases of illness of the serious type just defined. This is more than one case for every inhabitant per year.

When minor or trivial illnesses are included, and particularly ailments which would profit by medical or dental advice or treatment, the number of cases per year, according to certain somewhat limited findings of the censuses, are more than doubled.

The losses to society due to sickness are known to be many and heavy. Medical care and drugs must be paid for. Sickness is apt to have far-reaching effects in impairing the living and working efficiency of families burdened with it. Then there is the sorrow, the physical and mental suffering. Above all, the loss in actual working days, that is, in earning power. This latter item has been variously calculated and represents an enormous total. Thus in North Carolina, a most progressive state in matters of public health, with a male population over 15 years of age slightly in excess of 700,000, it has been estimated that no less than 5,250,000 working days are lost per year by the male population alone, and over 7,650,000 by the female population over 15 years of age. You may attach your own value to the worth of a working day.

PRESENT MEDICAL CARE OF THE SICK

What medical service do these huge numbers of sick receive? What interest have you as health officers in this? The Metropolitan Life Insurance Company surveys shows that no less than 27.2 per cent of the cases of sickness classed as "disabled," i. e., unable to work, were found to be wholly without the medical care of a physician. The States Charities Aid Survey showed 24 per cent of the disabled without medical care—a striking similarity in findings. Of the seriously sick, whether disabled or not, it would seem therefore that at least a fourth are without a doctor's aid. The total cases of serious sickness per year in the country was estimated at 135,850,000. On this basis about 34,000,000 cases of sickness which should have medical care go without medical care every year. And if we add to this number the more trivial cases which would profit by medical or dental advice, the number may, according to the census findings, be more than doubled.

The sickness censuses of the Metropolitan Life Insurance Company already referred, to revealed that of the total number sick 72.8 per cent were cared for. Of these, 61 per cent were cared for in the homes, 9.8 per cent in hospitals, and 2 per cent in dispensaries. On this basis, taking the country as a whole, 101,887,500 cases were cared for. Of these, 91,228,500 were cared for in home, 7,942,000 in hospitals, and 2,717,000 in dispensaries. In his book, *Dispensaries,* Dr. Davis states that between four and five million persons received medical care through the clinics and dispensaries of the country within a single year. If the present estimate that about 2,000,000 of

† According to the sickness survey findings the morbidity rate would seem to be slightly higher in parts of the country not covered by the surveys. Hence a rate of 25 rather than 22 per thousand was chosen.

‡ This is based on the important findings of Dr. Boris Emmet. The investigation covered 40,000 wage earners and 42 occupations. The average period of disability was found to be 6.6 days.

the seriously sick annually get care at dispensaries is correct, then it would seem that probably 1,000,000 cases of the class of minor illnesses, excluded by the censuses, seek and get the benefits of free, or nominally charged for, medical service today; whereas, several millions of the more seriously sick, who could pay something for medical service, do not seek or get it.

Nor do all cases which have medical care seem to receive adequate care. The State Charities Aid Association Survey, the only one that went into the question of adequacy or inadequacy of care, revealed that 20 per cent of the cases cared for in hospitals and 45 per cent of cases cared for in homes received inadequate care. By "adequate" care was understood care which resulted in the patient's recovery where recovery could be expected, and which was of such a character that neither the patient nor the community incurred avoidable risks. The statistical basis of this part of the survey was too meager to warrant application of these percentages to the country as a whole. Suffice it to say that evidently a very large proportion of the 91,228,500 cases cared for in homes had inadequate care due largely to poverty, improper surroundings, homes unprepared for convalescence, ignorant attendants, and insufficient medical attention. The inadequacy of hospital care was due largely to lack of social service follow-up work.

The round number figures which have been presented must, of course, be taken with a grain of salt. It can be said for them that they are the best obtainable. They seem sufficiently broad in scope and sound in method of derivation to suggest the advisability of their presentation, with the expectation that they will be used advisedly.

Two big things appear to stand out: a very large proportion of the seriously sick seek or get no medical attention whatever; a considerable proportion of those who do come in contact with the doctor in private practice or through the hospital get inadequate care. To the extent to which this is true the present organization of medical service in the United States has failed to accomplish its purpose from the point of view of public interest if not from that of the physician himself. Wherein may the remedy lie?

CHEAPER MEDICAL SERVICE

Quite evidently there is no lack of doctors. It would seem, too, that neither the time nor the equipment of private medical practitioners are used to the fullest extent. The difficulty seems to lie largely with the failure of the public to appeal for medical service.

How may the public be induced to ask for more medical service? One way would be to tempt it with a still better quality. However, under the present organization of medicine, better quality would seem also to mean still higher cost. Higher standards in medical schools, still greater specialization, more and finer equipment, and more plentiful, prompt and accessible service—these things, under a system characterized solely by individualism, will increase cost.

Another way is to maintain or improve, if possible, the quality but lower the cost. The experience of dispensaries and clinics everywhere goes to prove that as cost decreases demand increases. But cost can be reduced only through saving in the administration of medical service. And such saving must be effected, as in business activity elsewhere, through improved organization of the physical plant and of the human element, the physician. Economies in the use of the physical plant, i. e., particularly the scientific instruments and equipment, lie in better quality, greater usefulness, and more extensive use. Economies in the use of the physician lie in exactly the same things —the skill of each used where most useful, and used to the fullest capacity as to the time and strength of the individual.

In other words, present hope for a solution of the problem of inadequate medical service or lack of service seems to lie in the improvement of the organization of medicine, or in a re-organization, if that term describes better the necessary change.

POSSIBILITIES OF COMMUNITY MEDICINE

The term "Community Medicine" for the purpose of this paper is an abbreviation for all those forms of medical service expressed under the designations "co-operative medicine," "group medicine," "clinics," and "dispensaries." It is used in opposition to the individualistic practice of medicine as represented by the disassociated private practicing physician. We find it expressed pre-eminently in such institutions as the great Boston Dispensary (public) and the Mayo Clinics (private) of Rochester, Minnesota. The form most in the mind of the speaker, and the one from which he expects to develop his main line of thought, is the self-supporting, efficiently organized pay dispensary, set in some form of local health centre.

CHEAPNESS AND EFFICIENCY OF COMMUNITY MEDICINE

There seems to be general agreement that community medicine is cheaper and more efficient than is medical service rendered by the private practicing physician. The organization of plant, equipment, and personnel under the community medicine plan effects considerable savings. The patient comes to the doctor instead of the doctor to the patient. The time thus saved can be devoted to clinic practice. The scientific equipment installed at clinics may be employed during a maximum number of hours per day. This can rarely be true of equipment in the office of the private practicing physician.

The experience of the Boston Dispensary, under the able direction of Dr. Michael M. Davis, goes to show that "the total cost to the patient in treatment over an average period is no greater, and is often less, than the amount which the patient would have to pay for drugs alone if purchased at the price charged in drug stores." This statement relates particularly to the Syphilis Clinic. It was found, too, in the Eye Clinic that the usual retail prices of glasses alone was greater than the total expense of the administration fee in the dispensary clinic, plus the glasses, the latter being sold at a slight advance above cost.

Not only does community medicine appear to be far cheaper to the public than medical service under existing conditions of private practice, but it would also seem to be more efficient. Few doctors can afford the sort of scientific equipment which may be brought together for use in a community clinic. This equipment is apt to be both of a higher grade and to cover a wider range of service. The efficiency of community medical clinics is also increased by the fact that patients may be passed from specialist to specialist and thus in a very brief space of time receive the benefit of expert scientific diagnosis and advice. This feature is illustrated in an unusual degree by the Mayo Clinics of Rochester, Minnesota. (Those who are interested in reading a general account of the operation of the Mayo Clinics and prefer to reach such an account with a smile on the lips, are referred to an article by Dr. John A. Hornsby which appeared in the Modern Hospital Journal in May, 1918. Dr. Hornsby, it seems, had himself "put through the mill" to see if anything wrong could be found with his physical and mental make-up. His story of the procedure bears witness to the fact that humor is still alive in the medical profession.)

INCREASED DEMAND FOR MEDICAL SERVICE

Wherever community medicine, whether as dispensary, clinic, or other form, has been put in operation the popular demand for medical service seems to have been greatly stimulated. The rich can have medical service under all circumstances. They will probably always wish to have their own family physicians

and their own specialists. The poor are being reached by growing facilities for medical service through the medium of an increased number of free clinics and dispensaries generally attached to public and private hospitals. But the great middle class, with ability to pay something for medical service, but unable, or unwilling under existing conditions, to pay for medical service on the terms offered by private practicing physicians, appears to be in great need of a cheaper and yet equally, if not more efficient, form of service. The pay clinic would seem to meet the need of this large part of the population. And the need would appear to be particularly urgent today because of the universal shortage of physicians.

Even so intelligent a class as university students in our greatest universities do not seek medical service as frequently as the need of their own health would seem to require. This has been demonstrated in institutions where medical service for students has been inaugurated. It is stated that at the University of Wisconsin, as the result of free medical supervision supplied by the state, students consult physicians on an average probably four or five times as often during the year as they would have done if they had had to pay for each consultation.

DECREASES MORBIDITY AND MORTALITY

It has been customary to present the value of dispensaries and clinics in terms of the number of persons treated. Statistical data showing what improvement may be expected in a given population through the establishment of community medicine are very largely lacking. This is due to the fact that the population served in this manner is merged in the general population of the community. Such saving in sickness and death as is brought about loses itself in the general morbidity and mortality statistics of the community.

An interesting illustration which has produced statistical data of some definiteness may, however, be cited from the University of Wisconsin. I quote from an address by Professor John R. Commons on "A Reconstruction Health Program" which appeared in the *Survey* of September 6, 1919:

> "At the University of Wisconsin we have free medical supervision for five thousand students. No medical fee is charged. The state is taxed for health supervision of the student exactly as it is taxed for their education. As a result, the students consult the physicians on an average probably four or five times as often during the year as they would if they had to pay at each consultation, besides getting the thorough physical examination at the beginning of the year. The result has been a great reduction in sickness, a reduction in absenteeism from classes, and greatly increased student efficiency. The loss of time due to bed illness has been reduced 40 to 60 per cent, due to the early treatment of preventable conditions. The frequent consultations have reduced serious illness and its complications by at least 50 per cent. During the eight years of this medical supervision the university death-rate has been reduced to only one-fourth of the general expectant rate, exclusive of tuberculosis, at the same age period, and even the death-rate from the recent influenza epidemic was believed to be only one-fourth of the general death-rate attributable to that cause."

INCREASES ECONOMIC AND POLITICAL STABILITY

Community medicine would appear to be one way of attacking the present high cost of living. It decreases the cost and increases the demand for medical service. It decreases sickness and decreases deaths. It thereby signally increases productive capacity, actual production, and total net savings. This increase in economic efficiency, as a necessary corollary, means increased economic stability. And increased economic stability, as a necessary and under existing conditions most important corollary means increased political stability. These considerations are of genuine significance to the individual, to society, to the nation at large.

INCREASES THE EFFICIENCY OF HEALTH ADMINISTRATION

The experience of the Boston Dispensary and of clinics and dispensaries elsewhere points to their exceptional value as aids to the local health administration in the control of communicable diseases.

Large numbers of people come to these health centres. They receive expert examinations and diagnoses. Communicable diseases are apt to be promptly discovered. They can be effectively treated and centres of infection speedily located.

Wherever accurate and complete records, standardized if possible, are kept, community clinics occupy the position of an automatic, spontaneous, and continuous survey of community health conditions. The recurrence of similar case histories, a condition readily brought out by statistical records, will point to weak spots in the community's health. Occupational diseases may be located and responsible conditions remedied.

DECREASES THE NEED OF HOSPITAL SERVICE

Prompt and efficient medical service to an increasing number of members of the population is bound to prevent the development of numerous serious and more or less permanent complications in health. This reduction in the number of chronic sicknesses and in physical disability will necessarily mean a reduction in the need of community hospital service. This fact suggests, too, with considerable force, the wisdom of developing community health centres first, and community hospitals at some future time when the mass benefits of community medical service have come into operation, and hospital cases within the community have come to approximate the irreducible minimum. When this stage has been reached, assuming public sentiment to be in favor, the time may have come for the construction of a community hospital.

Serious thought need be given to whether it is wise to tie up public or private funds in a hospital structure at the outset rather than to turn financial support to the relatively inexpensive community clinic. These clinics, as has been demonstrated in Boston and elsewhere, can readily be made self-supporting. The community hospital has on occasion, it is said, proven to be a white elephant on the hands of a well-intentioned but ill-guided community which lacks the financial strength to maintain such an institution and to do in addition the other necessary public health work.

How far the success of a dispensary may be dependent on its connection with a hospital is still a mooted question. You are referred for argumentation to Dr. Davis's book, *Dispensaries*, and to such other sources as Dr. S. S. Goldwater's *Dispensaries, A Growing Factor in Curative and Preventive Medicine.*

COMMUNITY MEDICINE AND HEALTH INSURANCE

If health insurance is a good thing, then community medicine would appear to tend to encourage a good thing. Those who are interested in community medicine point to the experience of England, under its new health legislation, where the inadequacy of medical service through the panel doctors has proven unsatisfactory to all parties concerned. Properly organized clinics would tend to surmount such a difficulty, and by making service both cheaper and more efficient would appear to stimulate the movement toward health insurance.

Why health officers who are interested in the building up of a strong and efficient department of health should wish to concern themselves with the progress of the movement towards health insurance, is forcefully brought out by Professor John R. Commons in the already referred to paper. Professor Commons draws an interesting parallel between the relation of accident insurance and the safety-first movement on the one hand, and health insurance and what may be called the "health first" movement on the other.

COMMUNITY MEDICINE AND THE PHYSICIAN

It is stated that the main opposition to the development of community medicine comes from the ranks of the medical profession. On the other hand, there is much evidence in recent literature on the

subject that a large fraction of the profession is giving its enthusiastic support to this movement on the theory that its benefits to the physician considerably outweigh its objections.

It is claimed by some that the income of the capable doctor will be cut. There is much evidence, however, that his income will be increased. Emphasis is, of course, placed on the adjective "capable." There appears to be general agreement that the incompetent physician and the quack are the ones who will be most likely to suffer through the establishment of community medicine.

As already noted at the outset of this paper, community medicine appears to greatly increase the popular demand for medical service. By doing so it reduces the amount of self-administration of medical service and cuts down the consumption of patent medicines. This is an important item from the economic point of view. Huge sums of money, it is estimated, are thus devoted by the public to approved forms of medical service which otherwise would increase the income of the quack and of the patent medicine vendor.

Dr. Davis, of the Boston Dispensary, calls attention to the fact that the total cost to the patient of treatment at the pay clinics over an average period is no greater, and is often less, than the amount which the patient would have to pay for the drugs alone if purchased at prices charged in drug stores. He also points out that fully one-half of what the patient pays is paid back by the dispensary to the physician. This amount, if the patient were treated privately, would all have gone to the drug store or to the quack.

What large sums are involved in this deflection of private expenditures to the economic gain of the medical profession is suggested by the fact that, according to estimates of the Life Extension Institute, $500,000,000 are annually spent for drugs in this country and that most of them are at present self-administered. The per capita expenditure for patent medicines, it is calculated, has increased from about 35 cents in 1880 to $1.50 at the present time.

Dr. Goldwater in 1915 stated that a representative of a large retail drug firm in the city of Boston told him that the business of his firm alone amounted to $3,000,000 a year, largely in patent medicines.

Enormous quantities of quinine, estimated at two billion doses, are annually consumed in this country. Much of this, it is claimed, is not needed. Much of it is said to be harmful. Even after making due allowances for all possible errors in round number estimates of this sort, it will be evident to all of you that the money put into patent medicines and drugs in this country from year to year represents a huge total.

It has been pointed out by Dr. Michael M. Davis that a physician who, while in attendance at a pay clinic, gets a net income of $5.00 for a two-hour clinic, receives an equivalent of $5,250 per year on a seven-hour day basis. This, it is estimated, is equal to an income of $10,500 from private practice on what appears to be the generally accepted theory that 50 per cent of the gross income of the doctor goes toward meeting the expenses of doing business—expenses which a physician attending a pay clinic does not have to bear.

It is necessary, too, to bear in mind the point already emphasized, that a large portion of patients who take advantage of community medicine would not, in the absence of such clinics, seek medical service from private practicing physicians. This is demonstrated by the considerable increase in medical service in a community after clinics are established and by the large proportion of the disabled sick —over 25 per cent—according to the sickness surveys already referred to, who at present get no medical service at all.

The most serious consideration, from the point of view of the doctor, in connection with the community medicine

program, would seem to lie in the fact that a certain proportion of the local medical profession is apt to be excluded from practice at the clinics and is thereby placed at a serious financial disadvantage. The remedy for this, it has been suggested, is the organization of additional clinics. In other words, the number of clinics in a community is to be enlarged until all doctors, or at least all efficient doctors, are members of the clinic staffs. The least competent physicians are bound to be at a continuous disadvantage. The most competent men will be sought out when the first clinics are established. As additional doctors are needed the selection is apt to be progressively downward in the scale of competence. While this may be highly unfortune for the less competent doctor, he is being served in no other manner than are the less competent in every other department of life.

There can be no question that in this movement the spirit of individualism is in conflict with the spirit of coöperation. Nor can we deny the immense value of individualism to our progress in every field of activity. We have always pointed with pride to the fact that our phenomenal development was due to a spirit of freedom and enterprise born of an indomitable spirit of individualism. Medical men, undoubtedly, share in full measure in this same spirit. Every doctor wants a chance to stand or fall on his own merits. He wants the greatest opportunity of individual success and is willing to pay the price of individual failure.

We are learning, however, today that the world appears to be moving on to a new phase of coöperation where community interests take the place, largely, of individual interests. This change would seem to be evolutionary and being evolutionary quite irresistible. This new spirit and method in medicine finds an eloquent apostle in Dr. Davis who, in the closing paragraph of his book, *Dispensaries,* forecasts the future necessary relationship of the medical profession to coöperative medicine as follows:

"The medical profession must frankly face the changes which medical science is bringing upon medical practice. The leaders in the medical profession bear the responsibility of making the rank and file understand that there is now a scientific necessity for the co-operative provision of diagnostic equipment, and of facilities for reception and care of patients, and that there must consequently follow a large development of co-operative medical service through various forms of institutional organization. Individualism in medicine should continue, so far as it implies a sense of direct responsibility for the patient, but individualism must not be and cannot continue to be in antagonism to working as part of an organization, with graded responsibilities established therein. We may be confident that whatever is clearly demanded by the public interests as a whole should and will over-ride the special interests of any vocation or group; and also that there lies ahead of the medical profession a future of enlarged dignity and of more secure economic remuneration, if there is a broad community organization of the wonderful resources of medical science and of the skill of its representatives in the medical profession—an organization such as will render the very best of these resources accessible to all the people on a democratic basis. The great War is calling to everyone's attention the power of medicine to prevent disease among great masses of individuals whose countries were swept by pestilence, and to heal wounds and illness among the victims of the battlefields as these have never been healed before. The public will not fail to remember, however, that these wonders have been accomplished by organized rather than by individualistic medicine."

One cannot help but view the present situation with greatest optimism. The process of readjustment appears to be going forward apace with economic forces, as usual, in the saddle. Doctors are coming more and more to see that the economies of organization will permit of a larger average remuneration for the medical man; that lowered cost and increased efficiency mean greater demand for medical service; that greater demand for medical service means greater per capita expenditures for such service; that it means the deflection of huge sums of money heretofore spent on patent medicines and drugs largely self-administered to the pockets of practicing physicians.

Brilliant specialists and general practitioners will undoubtedly continue to hold sway with remunerative practice among the rich. In increasing measure they will, it would seem, give part time free to the poor as they have so generously done in the past. The incompetent doctors will continue to struggle along in the rear as incompetents in all human endeavor have done since time immemorial. They will continue to divide their time neither with the rich nor the poor, but just with themselves. The great body of sterling, capable physicians seem to be increasingly recognizing the fact that prosperity, congeniality, and stimulation attend closer affiliation with the expanding mechanism of community medicine. The speed of this readjustment will depend on the efficiency with which the leaders in the community medicine movement develop its advantages, and the effectiveness of the educational campaign among doctors through which they may in increasing numbers learn to see where their permanent interests appear to lie.

MALARIA CONTROL FROM THE ENGINEERING POINT OF VIEW

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Control of malaria is vital to the industrial development of the South and other warm regions and the engineer is vital to malaria control. The public must coöperate by understanding and by supporting improvements. Here is a plain educational statement of high value. It views the problems from many practical sides and suggests fundamental considerations.

MALARIA is the South's greatest problem. It affects 3,000,000 people and causes an estimated economic loss of $1,000,000,000 yearly.

Economically its insidious influence is felt by the banker and merchant, and by every business man whose prosperity is dependent upon the prosperity of the region he serves. The lumberman, the farmer, and every other employer knows that malaria is lowering the efficiency of his laborers, is reducing his production, and decreasing his profits. Rarely a fatal disease, it so lowers vitality that the fatality rate of other diseases is increased. But, most serious of any of its effects, is the handicap it places upon the child. To be enervated by malaria, during the years when the body should be developing into a sturdy, dependable machine, the mind and will growing and strengthening to correspond, means an appalling loss that can neither be calculated nor recovered. The solution of the problem lies with the engineer.

In studying the control of malaria, we must first consider the factors of its transmission, which are: A person infected with malaria—the anopheles mosquito—and the well person who may become infected. Thus we derive four lines of attack: Mosquito eradication to eliminate the transmitting agent; protection of well persons against infected mosquitoes by screening; protection of infected persons against non-infected

mosquitoes by mosquito bars and screens; and reducing the number of infected persons by quinine treatment. The first three methods are essentially engineering problems.

Since the Stone Age, the problem of diseases and man's bodily ills has been apportioned to the doctors; but, together with typhoid, malaria must now be assigned to the sanitary engineer, with the prophylactic measures left to the physician.

An effective campaign against malaria requires the coöperation of the public, for funds must be provided, and without the support of local officials and individuals the work would be seriously handicapped. The actual direction of the control work should have the closest team work by the physician, the biologist, the laboratory technician, and the engineer.

The physician studies the characteristics of the disease, its means of transmission and its cure. In malaria control, he is the principal factor in prophylactic measures. The biologist studies the habits of the mosquitoes, their choice of breeding places, food requirements, etc. He also investigates the natural enemies of the mosquitoes and their value as active agents in mosquito eradication. In the laboratory, the technician studies the organisms of the disease and the conditions which favor or prevent its development.

The sanitary engineer engaged in antimalaria work uses the data on malaria and its various factors, which have been collected by the physician, biologist, and in the laboratory, to devise the most effective and the most economic methods of controlling the disease.

Mosquito eradication eliminates the connecting link between the infected and the well person, and has proved a most desirable method of malaria control. Not an unimportant consideration is the popular favor which the work gains by adding to the comfort of the people. Though the physician observes the reduction in malaria, the average person notices the comparative scarcity of mosquitoes, and his comfortable evenings on the porch make him feel that he is getting something for his money.

The most effective method of mosquito eradication is the elimination of breeding places. This may require the drainage of extensive swampy areas where the reclamation of land for cultivation will make it economically feasible. Under other conditions the desired results may be accomplished by ditches, or the clearing of small streams, which would seem child's play to the drainage engineer accustomed to big projects. The important feature is not the size of the project but the thoroughness with which the work is done. No one part of the problem may seem great or difficult, but taken in its entirety, it presents a mass of details which must all be solved in order to make the work successful.

Where drainage is not practicable because the cost would be excessive in ratio to the benefits derived, other means must be employed, such as oiling, or fish control. The engineer must determine the most suitable materials and devise the best methods where oiling is used, and it is often necessary to clear the water surface in order to make the methods effective.

The top water minnow, *Gambusia affinis*, is a deadly enemy of the mosquito because of his voracious appetite for mosquito larvæ. Ideal conditions for this method of control are not often found in nature and the engineer is frequently called upon to help the minnow, either by removing vegetation and other protection of the larvæ, or by providing protection for the minnow against larger fish which would devour it.

For the engineer of an inventive turn of mind, malaria control offers a wide field. In mosquito eradication, as well as in other lines of engineering, many local problems will be met which must be solved on short notice and at low cost, without precedents to guide the

engineer. This was particularly true of the work in the extra-cantonment areas. No two zones presented the same problems. In one, tide gates were required to allow the drainage of swampy areas at low tide and to prevent their flooding at high tide. In another, vertical drainage was used to drain isolated water sheds with no surface outlet. In yet another, subdrains were installed to provide permanent drainage of marshes. All these are problems which will continue to present themselves, and for which more efficient and less costly methods can undoubtedly be devised.

There is a crying need for ditching machines suitable for mosquito control work, for which a special type of ditch is necessary. The drainage engineer is particularly interested in flood flows, and designs a large ditch, the purpose of which is to carry large quantities of water. The sanitary engineer engaged in mosquito control work is interested in the minimum flows. At such times, the wide flat-bottomed ditch which carries the flood waters will be a series of shallow pools, admirable breeding places for Anopheles. To prevent mosquito breeding a small V-shaped ditch in the bottom of the larger ditch is necessary. Trenching machines used in laying water mains or sewers make a straight-sided, flat-bottomed ditch, which would not be suitable for a permanent ditch. The cost of mosquito control could be reduced, and thereby the work greatly promoted by the development of a small, portable ditching machine, which could worm its way through streams, or ditches, or dig new ditches of the type necessary for this work.

Another problem is that of aquatic growths. It is often necessary to remove pond lilies, moss or other water plants from ponds in order to make oiling or fish control effective. Hand labor is a tedious and expensive method. Aquatic saws are on the market but they are costly and are not entirely satisfactory. In some extra cantonment areas an emergency was met by improvising an aquatic saw from the "licker-in" wires used at cotton mills. This is another opportunity for the inventive engineer.

The original work is the more expensive but maintenance is an expense which will remain, and any means of reducing this cost will do much to advance malaria control. A study should be made of the possibilities of lining ditches, possibly by placing wire netting and applying a thin wall of concrete with a cement gun. The initial cost would be increased, but maintenance cost would be eliminated by preventing the growth of vegetation in the ditches.

A kerosene burner for burning grass and weeds in ditches proved very successful in Panama, but the cost of this method as compared with hand cleaning, has not been determined in this country. With the increasing prices of oils, the question of the most economical as well as efficacious material to use, and the most satisfactory means of applying it, are important problems.

A few problems which present themselves to the sanitary engineer in mosquito control work have been enumerated in order to show that although the possibility of reducing malaria by the eradication of mosquitoes has been proven time and again; there remain opportunities in developing methods and reducing costs.

Screening has been mentioned as a method of malaria control. This is also work for the engineer, and though not a complicated engineering problem, it is another case where thorough work and close attention to detail is necessary. It may be added, that to effectively and economically screen some plantation tenant houses, without building a new house, is a problem which is beyond even the most ingenious engineer.

In malarious sections the control of this disease has an intimate relation with all engineering enterprises. In fact, it may determine the success or failure of an undertaking. We have an excellent

example of that in the Panama Canal. The chief reason of the French failure was the demoralization of their forces by yellow fever and malaria. When Mr. John F. Stevens was the chief engineer, he made the statement that there were three epidemics on the isthmus; yellow fever, malaria and cold feet. It was the sanitation of the Zone which made the canal possible.

The same is true, to a variable degree, of any enterprise in a region where malaria is prevalent. On a closely estimated engineering project the availability and efficiency of labor may be the determining factor between profit and loss. With a large percentage of the laborers infected with malaria there is a great loss of time on the part of the laborer, which reduces the available man-power. A considerable percentage of the men who are infected will not be sick enough to remain in bed, but will continue to work. However, their efficiency will be greatly reduced and the employer will be fortunate if he gets thirty cents' worth of work for a dollar in wages from such men. Labor overturn is also an important factor, for the securing of new labor is often expensive. Every employer knows that he will get greater efficiency—which means increased production at less cost—from healthy employees who are working under conditions which keep them satisfied. Such conditions are not possible where malaria prevails.

Engineers are largely responsible for increased malaria in many places. Storage reservoirs for water power projects have been built without considering the vast increase of mosquito breeding places, which could be prevented at reasonable cost, and as a result areas near some of these reservoirs have been practically depopulated. In building railroads and highways, the engineer leaves borrow pits which are not drained; places culverts too high so that ponds are formed above the embankments; and these provide excellent, but entirely avoidable, breeding places for Anopheles and are the cause of unnecessary "man-made malaria."

The control of malaria is vital to the full development of the vast resources of the South. It affects the agricultural, lumber, mining and manufacturing interests, probably more than any other one factor. There are sections in the South which have been practically abandoned by white people because of malaria. As affecting the development of agriculture, it may be stated that the most fertile lands are often found in the sections where malaria is most prevalent, such as the Mississippi Delta.

The lumber camps and saw mills have men idle or working at low efficiency because of malaria. The same is true of cotton mills, steel mills and other industries. With under-production on the farms and in the factories the revenues of the railroads are kept down. Many of the progressive corporations are conducting anti-malaria campaigns. The Tennessee Coal & Iron Company has reduced malaria cases among its employees and their families from about 3,000 to 50 per year. One result of this work is more efficient and contented employees, a condition which must have a wholesome influence on production records.

The railroads are growing more interested in the malaria problem, as it is becoming more evident to them that the disease is causing great inroads on their revenues. The financial benefits derived from malaria control have been shown by the St. Louis-Southwestern Railroad, known as the "Cotton Belt Route." Practically the entire system lies in a malarious region. Beginning in 1917, this railroad has conducted anti-malaria campaigns among its employees and in cities along its lines. One mill operator reported that the output of his mill had been increased 20% by the reduction of malaria. This resulted in an increase of $60,000 in the annual freight revenues

of the railroad from this mill. Many similar cases could be cited.

The various industries of the South, the railroads, and the financial interests are rapidly awakening to the importance of malaria control. The engineer is directly concerned with all development, being in many ways the pioneer with the possibilities of new ventures left to his judgment. With the control of malaria, he eliminates a factor which might prove his undoing. From the field party making the preliminary survey for a railroad or a water-power development project, to the employees of a saw mill or a city factory, malaria is a problem which confronts the engineer in the South at every turn. It is a problem which is of the utmost concern to every engineer and not only to the sanitary engineer who is directly engaged in the work.

At the present time an effort is being made to strengthen commercial relations with the South American countries and to build up an extensive foreign trade. Some parts of these countries have a high malaria rate and whether or not measures are taken to control the disease may mean the success or failure of many of the investments made of American capital in these countries.

The engineer is vitally interested in malaria control from a personal and professional point of view. This does not only apply to the sanitary engineer who is charged with the protection of the public health, but is equally true of any engineer who is located in a malarious region, or is connected with enterprises in a section where malaria is prevalent. Human efficiency is a great factor in the success of an engineer or of his undertakings. Human efficiency and malaria cannot occur together. The engineer must secure maximum results at minimum expense, which cannot be done with labor infected with malaria.

The engineer is interested in results, and delights in progress charts which show his accomplishments. If he is engaged in anti-malaria work he will often be discouraged at the lack of visible evidence of results of his efforts for he cannot see his bridge span the stream—his building rise toward the skies—or his dam gradually stem the flow of the river. But he must have vision to see the decrease in human suffering — the saving of life. He must see the child, who instead of starting out in life infected with malaria and the handicaps which that implies, is given an even chance as a result of the fight against this insidious disease. When he can see this, he sees the most important progress chart and he sees malaria control from the engineering point of view — the greatest benefit to humanity at the least cost.

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National Mine-Rescue Competition at Denver.—With a view of stimulating still further the safety movement among the mines and metallurgical plants of the country, a National First-Aid and Mine-Rescue Contest will be held under the auspices of the Bureau of Mines, Department of the Interior, at Denver, Colo., August 20 and 21, 1920. Mining teams from the principal mining companies of the country will participate, and especially those teams of the west that were unable to attend the national meet, held last year at Pittsburgh, Pa., in which more than 100 teams took part. The contest will be for the national championship in first-aid and mine-rescue work, honors which are coveted by every miners' team in the country. National contest cups, medals and prizes will be awarded to the winners.

D. J. Parker, in charge of the rescue work of the Bureau of Mines, has immediate supervision over the arrangements for the contest. Mining companies intending to enter are urged to get in touch with him at the U. S. Bureau of Mines, Pittsburgh, Pa. The contests will be decided solely according to Bureau of Mines standards and by judges thoroughly familiar with first-aid and mine-rescue work and with Bureau Mines practice.

AN INFERENTIAL INDEX OF SWIMMING POOL PURITY

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Score cards for swimming pools is the suggestion of this paper. Figures about these establishments are today in the class with crude statistics, and may lead to unreliable conclusions. Here are suggested various indexes which may be of service in framing minimum requirements for these pools. This article is an effort to clear up a complicated matter for which there are not now accepted standards.

NOT long ago Mr. Stephen de M. Gage directed our attention in a very instructive paper on the "Sanitary Control of Swimming Pools"* to a new way of stating the probability of contamination of these bodies of water. For the purpose of comparing different pools he invented the term *bathing load,* which he defined as the number of bathers divided by the capacity of the pool in thousands of gallons. Since the number of bathers using a swimming tank fluctuates from day to day and the operation schedule of the pool is most often based on a weekly cycle, he proposed for general use the *weekly bathing load,*—namely, the number of bathers per week, divided by the capacity of the pool in thousands of gallons. Previous to Mr. Gage's suggestion the probable contamination of swimming tanks was often ascertained by assuming the water to be equally divided among the persons using the pool in a given time. By this method, for example, a tank of 50,000 gallons capacity and a weekly attendance of 1,000 bathers presents a capacity of 50 gallons of water per bather per week, while the same tank with a weekly attendance of only 500 bathers presents a capacity of 100 gallons per bather per week. The relative probability of contamination is, therefore, expressed by the inverse ratio of the term under consideration. The *bathing load,* on the other hand, constitutes an expression, the values of which are in direct proportion to the probability of contamination, with a magnitude of 20 in the first case, for example, and one of 10 in the second.

The *bathing load* is a term very much like the crude or general death rate which reveals to some extent the health of a community but does not form a reliable basis upon which to compare the health of different cities. Similarly, the *bathing load* gives an excellent idea of the relative care which should be exercised to maintain in a sanitary condition, pools of different capacities and varying attendance, but without indicating the actual safety of the water. The existing contamination, so far, has been inferred from the results of bacteriological analyses of the pool water. It is, however, a question just what bacterial findings shall constitute a safe or dangerous condition of the same. Very few sanitarians have been willing to commit themselves to proposing a fixed standard of bacterial purity, and it is only recently that one of our Western state boards of health has adopted a tentative standard of a total bacterial count of 1,000 colonies per cubic centimeter on agar incubated at 37.5° C., for 48 hours and a *B. coli* count of one per cubic centimeter, determined by the usual standard methods. This progressive action is indeed commendable, but it is debatable whether or not

*Stephen de M. Gage. The Sanitary Control of Swimming Pools. Jour. Boston Soc. Civil Engrs., Vol. 5, pp. 229.

this tentative standard has the approval of the great number of investigators. In the above mentioned paper*, for example, Mr. Gage states on the one hand that he considers satisfactory a swimming pool water complying with the United States Treasury Standards for drinking water, but he further qualifies his opinion by saying that, under certain conditions, one may obtain counts of several million bacteria and yet consider a pool safe. This, the writer believes, is a very logical stand to take relative to the problem of bacterial purity of swimming pool water. As in all other questions of water analysis, the actual purity of pool water is often very different from the safety inferred from bacteriological tests. An acquaintance with existing conditions is frequently of more value than a few bacteriological analyses which, if correctly interpreted, serve a very good purpose in strengthening the evidence collected *in situ*, but which, under most conditions of public supervision, are limited in number and often not representative. The writer holds no brief against bacteriological standards for water and does not wish to deprecate the efforts of those investigators who are attempting to formulate a standard of bacterial purity for swimming pools, but he does believe that our present understanding and present methods are not sufficient to warrant the adoption at this time of even a tentative standard of bacterial purity unless the same can be made very broad indeed, and then it will be rather hard to formulate. Aftergrowths of harmless water organisms following disinfection and immense variations in the bacterial flora caused by keeping swimming pools at high temperatures, for example, might be sufficient to condemn, under our present system of interpretation, a pool which is really perfectly satisfactory. Furthermore, it is practically impossible to compare, on a basis of total counts, a tank operating at from 68° F., to 70° F., with one in which a temperature higher than 72° F., is maintained. Yes, even with expert supervision and analytical control sudden increases in bacterial growths are frequently unavoidable. The presence of coarse suspended matter, hair, lint, etc., and other foreign substances such as sputum and epithelial cells, may also contribute large numbers of organisms to the samples, thus leading to false inferences and making the errors of sampling very large indeed. While, therefore, bacteriological analyses may be of doubtful value in establishing a standard of swimming pool purity, they still have their very good place in the checking of disinfection and water treatment and will always remain of inestimable value in the sanitary control of private and public bathing places.

For these and other reasons the writer has tried to attack the problem of an index of swimming pool purity from a different angle, based in its elementary conception upon the *bathing load*. If, for example, it is possible by considering the ratio between the number of bathers using a pool in a given time and the tank capacity, to conceive an idea of the probability of contamination of the pool, it is likewise possible, by considering not only the number of bathers and the tank capacity but also the number of times that fresh water is added to the tank or tank water is purified by disinfection or filtration, together with the quantities dealt with in each case, to obtain an indication of the actual purity of the pool, just as an analysis of a general death rate is made by computing the component specific rates. Assuming again a pool of 50,000 gallons capacity, a weekly attendance of 1,000, a resulting *bathing load* of 20 and daily disinfection of the pool body, we can reason that the actual contamination is directly proportional to the relative amount of disinfected or otherwise pure water furnished each bather. We thereby define the *index of contamination* as the expression obtained by dividing the number of bathers using the pool in a given time by the amount of

disinfected water in thousands of gallons, remaining at liberty to determine a weekly, daily, or hourly *index of contamination*. In the case assumed, the value of the weekly index is equal to one-sixth of the bathing load, or 8.3, increasing to 16.7 if disinfectants are applied only three times a week. The Committee on Sewerage and Sewage Disposal of the American Public Health Association* recently defined contamination as *the introduction into a water of bacteria or other substances which tend to render it unsuitable for domestic use*. If we retain the spirit of this definition, the index of contamination therefore becomes a term denoting the bacterial purity of the water. An index of low value signifies that effective measures for disinfecting the water or otherwise displacing it by uncontaminated water are in force, and one of high value reveals that the processes of pool operation are unsatisfactory.

This method of analysis, however, does not disclose the esthetic condition of the pool or the physical safety of the water. Favorable bacterial counts may be obtained by frequent disinfection of an otherwise stagnant pool rendered unsightly by the presence of surface scum and collections of sediment, hair, lint, etc., and made dangerous by the darkness of color or quantity of suspended matter contained in the water. For this reason, it might be well to continue our study for the purpose of finding a different expression from which can be inferred the esthetic condition of a swimming pool. Such a term might be called an *index of pollution*, for the above mentioned committee* defines pollution as *the introduction into a water of substances of such character and in such quantity that they tend to render the body of the water (or river) objectionable in appearance (or to cause it to give off objectionable odors)*. Unfortunately, however, the words contamination and pollution are still loosely used interchangeably to express the same condition. It might therefore be better to call the expression an *index of stagnation*. This method of reasoning is based upon the fact that it is the stagnation of the swimming pool which brings about the unsightly and dangerous conditions mentioned above, which in turn constitute a state of pollution. If, once more, we assume a pool of the same description as before, the water of which, however, is recirculated at a rate sufficiently high to turn over the pool once a day, the water being filtered during recirculation, we obtain by a similar method of reasoning as before an *index of stagnation* equal to the number of bathers divided by the amount of filtered water in thousands of gallons,—in this case one-sixth of the bathing load, or 8.3, increasing to 16.7, when the pool is recirculated only once in two days.

A consideration of the three expressions—*bathing load, index of contamination,* and *index of stagnation*—furnishes us with important information as to the sanitary condition of a swimming pool and makes possible comparisons between pools of different capacity, attendance, systems of disinfection, methods of operation, temperatures, etc. The use to which these expressions may be put is illustrated in Table I, the data for which are taken partly from Mr. Gage's paper and partly from unpublished or hypothetical sources.

The method of obtaining the figures in Columns 11 and 12 of this table is illustrated by a consideration of the data relating to the natatorium at Brown University. The water in this pool is recirculated and filtered at a rate of 0.96 times a day, a total of 432,000 gallons of repurified water being added per week. At the same time the pool is raised two inches six times per week for the purpose of removing scum collecting on the surface of the pool, or to replace water lost by splashing or displacement, a total of 14,100 gallons of fresh water being added

*Report of Committee on Sewerage and Sewage Disposal. A. J. P. H., 1917, Vol. 7, pp. 847.

per week. The sum total of clean water added per week is therefore 446,100 gallons, representing an *index of stagnation* of $\frac{450}{446}$ or 1.0. The pool is furthermore disinfected twice a week, 75,000 gallons of water being treated each time. The total amount of disinfected or otherwise uncontaminated water coming in contact with the bathers is therefore 150,000 plus 14,100, or 164,100 gallons, thus establishing an *index of contamination* of $\frac{450}{164.1}$ or 2.7.

The *indices of contamination and stagnation* in Table I have been worked out for weekly cycles of pool operation. After a closer study of this subject it may be found necessary to decrease the length of time over which the index extends and to compute a daily or, better, an hourly index, as illustrated in the following example. Assuming a pool of 50,000 gallons capacity with a weekly attendance of 1,200 bathers, the water in the pool being uniformly recirculated and disinfected for eight hours at a rate of three turnovers, or 150,000 gallons, per day, we obtain the following expressions for an eight-hour bathing day.

Weekly bathing load	24.0
Weekly index of stagnation	4.0
Weekly index of contamination	4.0
Daily bathing load	4.0
Daily index of stagnation	4.0
Daily index of contamination	4.0
Hourly bathing load	0.5
Hourly index of stagnation	4.0
Hourly index of contamination	4.0

Presupposing an even attendance, therefore, the *indices of stagnation and contamination* must remain the same for all time intervals, while the bathing load suffers a decrease proportional to the time interval. If, on the other hand, the water in the pool is recirculated and disinfected for 16 hours, at a rate of only one and one-half turnovers, or 75,000 gallons, per day, the total amount of water recirculated and disinfected during a day remaining the same as above, the *hourly index of stagnation* increases to 8.0, together with the *hourly index of contamination*, but the other expressions remain unchanged. The true daily and hourly indices vary furthermore with the different numbers of bathers using the pool in the time intervals under consideration. It is a question whether the figures given by the weekly indices are or are not of sufficient practical value to be used in the stead of indices based upon shorter intervals of time.

The relation of the quality of pool water to the *indices of contamination and stagnation* is illustrated in Table II, the data for which were derived from Mr. Gage's much quoted paper.

A consideration of the figures in this table establishes the fact that the correlation between average bacterial counts and the indices is quite noticeable. With the exception of the Pawtucket Boys' Club Pool, 20° C. counts higher than 1000 and 37° C. counts higher than 4 were not obtained for an *index of contamination* less than 7.8 and an *index of stagnation* less than 4.9. Similarly, positive *B. coli* results were obtained only for *indices of contamination* more than 9.3 and *indices of stagnation* more than 4.9. The exception established by the Pawtucket Boys' Club may be explained by the fact that small boys are proverbially dirty and that the pool is operated apparently without disinfection on the fill and draw principle. The use of data relating to the bacterial purity of tank water might seem inconsistent with the writer's attempt to establish a new and different index of swimming pool purity, providing that the figures given in Table II were not averages of many analyses and providing that many objections to a standard of bacterial purity to which every single chance sample examined must conform, were not met in a study of averages.

Certain special cases may arise in which it may be necessary to modify the procedure of determining the various indices. If, for example, the amount of disinfectant added to the pool body or the recirculating water is only sufficient to

TABLE I.

	Capacity Gals.	Bathers per Week	Time Between Refilling Days	Times per Week Fresh Water Added	Height Pool Raised When Fresh Water Added Inches	Times per Day Pool Turned Over by Recirculation and Filtration	Times per Week Pool Disinfected	Capacity of Pool Gals per Bather per Week	Weekly Bathing Load	Weekly Index of Stagnation	Weekly Index of Contamination
1	2	3	4	5	6	7	8	9	10	11	12
Boston Y. M. C. A.	78,000	500	.....	6	.....	1.5	During recirculation	156	6.4	0.65	0.65
Brown University	75,000	450	120	6	2.0	0.96	2	167	6.0	1.0	2.7
Pawtucket Boys' Club	65,000	130	5	1	.....	.....	not known	500	2.0	2.0	not known
Providence Y. M. C. A.	50,000	1200	105	6	6.0	0.72	2	42	24.0	4.9	9.3
Newport Y. M. C. A.	45,000	600	110	1	1.0	0.06	1	75	13.3	37.8	13.1
Pawtucket Y. W. C. A.	30,000	87	310	6	6.0	0.67	1	345	2.9	0.64	1.9
Woonsocket Y. M. C. A.	30,000	240	160	1	1.0	not known	1	125	8.0	.....	7.8
U. S. N. Training Station (Newport)	30,000	135	1	6	.....	.....	.....	222	4.5	0.75	0.75
Pawtucket Y. M. C. A.	28,000	600	45	3	0.5	0.04	1	47	21.4	83.6	20.9
Newport A. & N. Y. M. C. A.	28,000	300	65	1	0.4	not known	1	93	10.7	.....	10.2
Moses Brown School	21,000	325	80	6	0.7	not known	6	65	15.5	.....	2.6
Aborn St. Baths, Providence	18,000	88	14–21	0.5–0.33	.....	.....	not known	205	4.9	9.8–14.7	.....
Lundin St. Baths, Providence	9,500	75	3– 7	2–1	.....	.....	not known	127	7.9	3.9– 7.9	.....
Hypothetical Fill & Draw Operation	50,000	1000	1	6	.....	.....	.....	50	20.0	3.3	3.3
Hypothetical Recirculation	50,000	1000	– several –	6	6.0	1.0	6	50	20.0	3.0	3.0
Hypothetical Recirculation	50,000	1000	– months –	6	6.0	1.0	dur. recir.	50	20.0	3.0	3.0
California State Board of Health Recommendations											
(a)	50,000	1000	1	.....	.....	800–2000 gals. added per bather	0	50	20.0	0.5–1.2	0.5–1.2
(b)1	50,000	1000	sev. days or months	.....	.....	1.0	6	50	20.0	3.0–3.3	3.0–3.3
(b)2	50,000	1000	"	.....	.....	1.0	12	50	20.0	3.0–3.3	1.6–1.7
(c)	50,000	1000	"	.....	.....	1.0	dur. recir.	50	20.0	3.0–3.3	3.0–3.3

reduce the bacterial counts by 50 per cent, the index of contamination must be computed by dividing the number of bathers by one-half the amount of disinfected water. As suggested before, it is in the study of conditions similar to this that bacteriological methods are of value.

The two *indices of contamination and stagnation* become *standards of contamination and stagnation* when a certain definite value is assigned to them. After extensive studies covering many different types of swimming pools, for example, those state boards which have the power to regulate public bathing places may find that a value of, say, 0.5, 1.0, or 2.0 for the *index of contamination* and the *index of stagnation* is usually found in swimming pools which are satisfactory from the standpoint of public health. It would then be possible to call the respective value a *standard of contamination* and a *standard of stagnation.* These specific standards, however, must always remain only part of an actual standard of swimming pool sanitation, for it is evident that the sanitary condition of these bodies of water is not controlled merely by the purity of the pool water, but is dependent upon the many other questions of preventive sanitation, pool construction, supervision, etc., which together tend to produce an harmonious whole. We must, therefore, expect to continue our analysis for the purpose of incorporating requirements relating to the methods and facilities of preventive sanitation, conditions of drainage, methods of cleaning, etc.

The writer believes that all these specific standards or indices may be incorporated to good advantage in a score card in which the methods and facilities of the pool shall be rated as parts of a perfect score adding up to a certain minimum which will be the true standard of swimming pool sanitation. Regulations of public restaurants and other establishments in which food is handled do not confine themselves to an examination of the number of bacteria found on the knives, forks, and plates, but are generally incorporated in a score card such as the one described above. Scores for dairies and schools, etc., have also been in use for some time. We may, therefore, look forward to the introduction of a score card for swimming pools in which the *indices* or *standards of contamination and stagnation* shall form two of the major divisions; the details of such

TABLE II

	Bathing Load	Index of Stagnation	Index of Contamination	Average Bacteria per cc.			B. Coli		
				20° C	37° C				
					Total	Red.	0.1 cc.	1.0 cc.	10.0 cc.
1	2	3	4	5	6	7	8	9	10
Brown University	6.0	1.0	2.7		3	1	0	0	0
Pawtucket Boys' Club	2.0	2.0	2.0	1,300	10	0	0	0	+
Providence Y. M. C. A.	24.0	4.9	9.3	17,000	2	0	0	0	+
Newport Y. M. C. A.	13.3	37.8	13.1	17,000	2	1	0	0	0
Pawtucket Y. W. C. A	2.9	0.64	1.9	150	0	0	0	0	0
Woonsocket Y. M. C. A	8.0	.....	7.8	5,500	4	1	0	0	0
Pawtucket Y. M. C. A.	21.4	83.6	20.9	32	6	1	0	0	+
Newport A. & N., Y. M. C. A.	10.7	.....	10.2	28,000	65	3	0	0	+
Moses Brown School	15.5	.....	2.6	380	1	1	0	0	0
Aborn St. Baths	4.9	9.8-14.7	....	13,500	30	17	0	+	+
Lundin Baths	7.9	3.9- 7.9	....	140	23	11	0	0	0

a score card, however, are not within the scope of this inquiry.

SUMMARY

The salient points of this discussion are summarized as follows:

1. The *bathing load* gives an idea of the relative care which a pool must receive to make it sanitary.

2. It is extremely hard to formulate a standard of bacterial purity for swimming pools.

3. The *index of contamination,* equal to the number of bathers using a pool in a given time divided by the amount of disinfected water added to the pool during that time, establishes a conception of the actual bacterial purity of the swimming pool.

4. The *index of stagnation,* equal to the number of bathers attending a pool in a given time divided by the amount of clean or refiltered water added to the pool during that time, gives an idea of the cleanliness of the pool water and consequently of the esthetic condition and physical safety of the pool.

5. It is impossible to regulate a public bathing place merely by prescribing a certain standard of bacterial purity or similar expression. A system of scoring the entire sanitary equipment of these institutions and the establishment of a minimum score is therefore recommended.

PUBLIC HEALTH ASPECTS OF CARTAGENA, COLOMBIA

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Mr. Zubiria, a native of Cartagena, gives this outline of the sanitation of a country concerning which little has been observed or published. In view of constantly increasing trade with Latin America, such information may be of practical value.

THE city of Cartagena, or "Cartagena de Indias," as it was called before the Independence (1810) by the Spanish government, to distinguish it from Cartagena of Spain, is one of the most important cities of Colombia, South America, not only because of its commercial enterprise, but because of its being a seaport of the country which receives from the city its second largest income through the customs duties. Cartagena is also a very old city with a thrilling history attached to every speck of dirt in the imposing ramparts, or walls, which completely surround the city, for the reason that Morgan, Drake and Vernon indulged in their favorite sport of attacking and sacking the city to extract from it the wealth which the Spaniards stored within its fortifications. It was founded in the year 1533 by Don Pedro de Heredia. It is situated on the shores of the Caribbean Sea, at 10°26′01″ N. latitude and 1°29′33″ west of Washington. The city proper is an island connected to the mainland by many short bridges which span the narrow canals separating it from the continent. The population consists of 41,583 inhabitants, according to the census taken in 1918. Of those about 20 per cent are blacks and 60 per cent "mestizos" or half-breeds, leaving about 20 per cent of pure whites, descendants of European races, mostly Spanish. Of the mestizos there are innumerable shades of color, from dark brown skinned to pale colored ones, which pass for whites. It is these latter who by sheer force of numbers form the backbone of the country, and who by their ambition for progress and self-advancement keep the pure white population on the alert lest their supremacy, gained by the merit of education and position, be seriously jeopardized.

Schools abound in the city. There are kindergartens, preparatory schools, public schools, and the University of Bolivar in Cartagena. In the public schools tuition is free, but the instruction is not obligatory, and the students must procure their own books and supplies. In matters of public education, however, Colombia stands forth among the 20 republics of Latin America.

The health problems of the city are many, for its sanitation at the present time is regulated by a very incomplete and antiquated body of regulations. The Board of Health is doing all in its power to cope with the situation, and in view of the fact that it consists merely of a "Director de Sanidad," Doctor of the Port, a Milk Inspector and a Food Inspector and a City Chemist, it is a wonder that the city is not visited more frequently by epidemics and pestilence. The budget allowed for the city's sanitation is much too meagre, and, therefore, the number of street cleaners and other minor employees and the equipment of the Health Board, leave much to be desired.

The activities, therefore, of the Board are necessarily limited. They have been hinted at above by the names of its members. The Director of Sanitation, as his title implies, is the executive in the health work of the city; the Doctor of the Port examines all the passengers of incoming steamers, and has the power to reject all those whose landing might seriously endanger the health of the people. The milk and food inspectors attend to the milk and food supplies. The former has a staff of agents who look after the milk distributors and milk selling stations, to prevent adulteration of the milk. The latter inspects the food products as sold in the public market place. The city chemist analyzes everything from milk and water to meat, beans and rum. He has a laboratory, but has no other chemist to assist him.

Water Supply. This consists of well waters and rain water. The former is used for household purposes; the latter for drinking water. Every home has at least a well; most homes have also an "aljibe," or cistern, which consists of a subterranean vault built under the front "patio," or garden, and having walls of cement and its bottom of brick or cement. This "aljibe" is filled by the rain waters which are collected by tin gutters and pipes. The gutters are placed in such a way as to collect the water flowing down the inclined tiled roofs. They empty into two vertical pipes which conduct nature's precious liquid gift down into the cisterns. Here the water is stored for use by the family occupying the house, which usually numbers from 5 to 30 people, including servants, and serves also to supply the neighbors when their supply is exhausted. As the rainy season lasts about six months and is followed by six months of dry weather, many "aljibes" do run dry, and that family has to obtain water from its more fortunate neighbors, or from its own wells, if necessary.

How the water is handled in the homes may be of interest to the visiting tourist. He need not be alarmed when his hospitable host offers him an earthenware cup from which to drink, nor when he takes the water out of the large earthenware "tinaja" with a tin vessel provided with a long handle to fill the drinking cup. The "tinaja" is a large-sized earthenware vessel, the shape of an egg, standing on its broad end and truncated at its narrower end. It may be two feet to four or five feet high, and have a diameter of a foot to three feet at its broadest place, with the opening of about a foot in diameter. It has been found to be the best means of keeping the water ready for drinking, for it cools it by the evaporation through the porous wall which furnishes an excellent insulation and at the same time acts as a bacterial remover (by absorption). Instead of a "tinaja," the water can be kept ready to drink in small earthenware bottles. All these and the drinking cups are kept covered at all times by earthenware covers. There is no better and safer means of keeping drinking water cool in the home in the hot climate of the tropics.

For the last twelve years Cartagena has been supplied with water for its increasing industrial and household needs, by the aqueduct of an English waterworks company. The water is brought from the springs of Matute, about ten miles outside of the city. It is a very hard water, containing sulphates and carbonate of lime and magnesium. The hardness is so great that at the present time the city is suffering from lack of water due to the inability of the mains to transport it from the source. The inside of the conduits are covered with a coating which has diminished the diameter of the pipes one-half. The problem will have to be

solved by a new installation of larger pipes to transport the amount of water which Cartagena needs today. The water is supplied to the city in its natural state and is quite fit to drink.

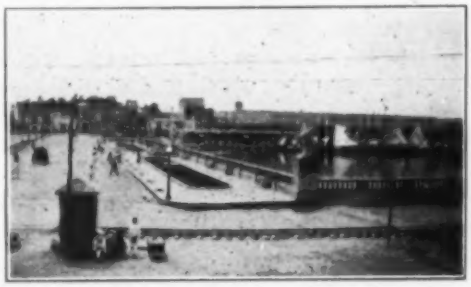
A public square, Cartagena

Milk Supply. The milk supply of the city comes from 20 to 30 different "haciendas," or farms, which are primarily intended for cattle raising, the milk being sold as a by-product. The milk is collected, shipped and distributed in the most primitive ways. Since most of the "haciendas" are situated at from 5 to 15 miles distance from the city and there are no "milk trains," the farmers milk their cows at midnight, or in the early hours of the morning, in order to have their milk reach the city by sunrise, 6:00 a. m. The milk is collected in the "corrals" into open pails placed on the ground, and by not very clean or careful milkers. The pails are then emptied into the regular milk cans, which are then covered, the cover being made tight by introducing dry corn husks between it and the mouth of the can. Two cans are then mounted, one on each side of a burro or a mule, and on the back of these most useful beasts of burden are carried to the city. The cans are locked by careful milk dealers in order that the milk carrier may not adulterate the milk, watering being a favorite pastime among the latter.

The milk is distributed in the city at the doors of the customer's homes. The milk carrier dips a small tin measuring cup into the milk, introducing the whole length of his arm if necessary, into the can and the tips of his fingers half of the time.

Why, with such insanitary practices, are there not more frequent and serious epidemics of typhoid and other intestinal diseases? The answer lies in the fact that milk is brought to a boil in every home before it is consumed, no matter how poor its inmates may be; for by some it is considered unthinkable that milk can be consumed raw; by the others that such a practice would be unsafe. Milk that has already been boiled in the morning is again boiled at noon just before it is used, cold milk being an unknown luxury in the city.

Public Market. In the public market, a large building situated at the water front in the harbour, meat, fish and fruit, as well as small eatable animals, are sold to the cook or other servant sent by the housewife to buy the day's provision early after sunrise. It is also the place where almost all the grocery stores which supply the city



Public Market at Water Front

are located. Here food is sold at competing prices, fresh and cheap. The food is brought to the market place by burro or mule back or in schooners from the nearby villages and farms. The fact that it is all to be found in one large building (covering a large

city block) makes the task of food inspection comparatively easy. Meat must be sold within 24 hours of the slaughter of the animal, so this article, as well as many others, are always to be obtained fresh. There are no cold storage plants, so that decayed foods are easily detected through the active bacterial life encouraged by the climate.

Sewage and Garbage Disposal. Mechanical sewerage is as yet an unrealized dream in Cartagena. The streets are drained by uncovered gutters, which run all along the foot of and surround the city walls. In important places in the city there have been built underground sewers of a very primitive nature and grade of efficiency. The drainage canals empty into the harbor in various places.

Garbage collection is practiced regularly by the city, the refuse being disposed of in out-of-the-way dumping grounds by the sea. The sun's merciless rays take care of it. These places are very popular with the black buzzards, which are efficient consumers of any decaying animal matter. In the homes of the people themselves, it is a common sight to have three or four of these birds perched on the roof's edge, patiently waiting for the time when the family cook throws to them the trimmings of the chicken or beef, which is being prepared for the day. No sooner have these reached the ground in the back "patio" than the three or four buzzards have sprung on them and devoured them. It is a very quick way of disposing of meat trimmings which might otherwise attract flies in the garbage cans. Yet it is to be hoped that such a primitive way of disposing of the household refuse will soon be replaced by more sanitary and efficient methods.

Restaurants and Food Stores. There are only four properly called restaurants in Cartagena where the sale and service of food is the main business. It is a common practice, however, to have open air kitchens about the public market place where meat, fish, etc., as well as the staple food, rice, are cooked. These serve for the laboring man's meals. They can there see for themselves how their food is handled before accepting it. Of course, flies and other undesirable visitors are not uncommon, and thereby hangs the tale of woe of the health authorities. Walking ice cream and refreshment vendors are a common sight. However, very good restaurants are managed in connection with hotels, boarding houses and clubs in the city, where the food is handled

Uncovered Gutters run along the foot of the City Wall

in a satisfactory manner and cooked in the usual tropical style—plenty of grease and condiments—as well as in the European and North American ways.

Housing Conditions. Here again is a problem for the city to solve in the old colonial quarters, where the streets are very narrow and not exactly symmetrical, and where half of the people live in "accesorias" (also called "vivi-endas"), dark, damp rooms on the ground floor, into which light and air enter from the street windows, or from the door, which opens into the interior of the house. These conditions are maintained in the quarters enclosed by the city walls, and are at times in sharp

contrast to the comfort and cleanliness of the family occupying the upper floors of the house. In the new parts of the city, which have now grown in the suburbs to be about twice as extensive as the original city proper, there are stately residences surrounded by gardens and equipped with modern comforts for all tastes, and where sanitary conditions are very satisfactory.

About nine-tenths of all buildings in the walled part of the city are of brick and stone, about half of them in the remote parts of the suburbs are built of wood and have palm thatched roofs, which make the rays of the tropical sun bearable and even keep the house cool. Most of the buildings, in fact, three out of five in the city, have a "patio" where flowers and small plants make a delightful garden to look at and enjoy from all parts of the house. This is situated, of course, on the ground floor. All the rooms of the house open out into the patio, a balustrated corridor intervening between the room doors and the garden. The roofs of the houses are of the Spanish red-tiled style, which make a picturesque contrast with the whitewashed (by a lime emulsion) walls. The houses of the well-to-do have also a "mirador," which translated literally, means a "lookout" tower. From the tops of these towers the whole city can be viewed and the surrounding blue water of the Caribbean admired. From here also one can appreciate the outdoor life which the people lead even in the walled city, for amidst the red-tiled roofs and white washed walls and towers, one sees the broad green leaves of the banana plant or the palms of the cocoanut trees of the patio, the whole brilliantly illuminated by the sun of a tropical day furnishing a realized dream of the peace and quiet, which mark the life in the tropics.

The City and the Blue Caribbean

The "Patio" from the "Mirador"

Hospital Facilities. There is a very commodious "Hospital de Caridad" in Cartagena, managed efficiently by the Sisters of Charity. It occupies a whole large-sized block overlooking the sea. It has been in operation for the last fifty years and fills a great need for the poor of the city and of the surrounding districts. There are also special private clinics of physicians of the city which accommodate those who can afford them for especially serious surgical operations.

Medical facilities are afforded by many notable physicians, products of the country, graduated in the schools of medicine in the several universities of Colombia. Of these universities may be mentioned the "Universidad de Medicina" of Bogota (the capital), and the "Escuela de Medicina" of the "Universidad de Bolivar." Among the physicians of Cartagena may be mentioned Drs. Rafael Calvo, Tatis, Obregon, Pajaro, Barboza, Valiente (a graduate of the University of Illinois Medical School), Paz and many others.

Leper Colony. On entering the harbor of Cartagena one is surprised, not to say shocked, by the sight of the leper colony. This consists of a small village of thatched roofed houses of some 800 inhabitants. Those people are, however, well cared for and comfortably lodged in clean houses and amid pleasant surroundings, attended by a physician paid for the purpose. This colony is maintained by the government, and the latter has in it a vital problem to solve, for there is much to improve in the life of those unfortunates who depend more on the unlimited charity of the ladies of Cartagena than on the appropriations of the national treasury. At the present time the matter is attracting a great deal of attention from the government.

Vital Statistics. Under the item of population the number and color classification of the inhabitants has been approximately given. The writer says *approximately,* because he regrets to say, statistics in Cartagena are very poorly kept and data published by the registrars there cannot be accepted without further analysis. He regrets also that he has no figures at hand which he can offer as positively exact. However, the following statistics may be accepted as fairly accurate, coming as they do from such an authoritative source as Dr. Felipe S. Paz, Professor of Statistics at the University of Bolivar in Cartagena. In a study by Dr. Paz on the population of Cartagena, published in *El Porvenir,* the oldest daily paper in Cartagena, with the title of *Apuntes Sobre la Poblacion de Cartagena,* we find the increase in the number of inhabitants of the city since 1871:

INCREASE OF POPULATION OF CARTAGENA

Year	Inhabitants
1871	8,603
1881	9,681
1882	11,975
1900	17,717
1918	43,583*

MORTALITY OF CARTAGENA

1872-1918

Year	Population	Deaths	Rate per 1,000 during the year
1872	8,603	877	101.94
1881	9,681	658	67.96
1882	11,975	664	55.44
1909	17,717	587	33.13
1918	41,583	729	17.53

Note: In 1918 the death rate may be considered a little too low since the population figure includes many outlying districts in which deaths and births are poorly and incompletely recorded. However, 20 per thousand would not be a bad estimate. It is a very high percentage, due to the utter lack of instruction among the lower classes of "mestizos" and blacks regarding hygiene, both municipal and personal.

The following table, taken from the excellent historical treatise of Urueta and Pineres, *Cartagena y Sus Cercanias, pp.* 45-48 (*Cartagena and its Suburbs*), gives an idea of the deaths and main causes of death in the city between the years 1872 and 1910.

NUMBER OF DEATHS BETWEEN 1872 AND 1882, ACCORDING TO SEX BY YEARS

Year	Deaths (Males)	Deaths (Females)	Totals	Population	Death rate per 1,000
1872	473	404	877	8,603	102
1873	117	132	249	....	...
1874	142	131	273	....	...
1875	141	139	280	....	...
1876	119	120	239	....	...
1877	196	171	367	....	...
1878	234	303	537	....	...
1879	212	249	461	....	...
1880	294	264	558	....	...
1881	306	352	658	9,681	68
1882	314	350	664	11,975	55
	2,548	2,615	5,163	99,083	...
Averages			469.4	9,008	52

In this table there are excluded the deaths during the months of July and August, 1872, the time of the fierce cholera outbreak, which caused an appalling number of deaths. It was the epidemic commonly called "El Tablon." Columns 5 and 6 were added by the writer in order to calculate the average death rate for the period. The

*This last figure includes the population of all the suburbs and districts under the jurisdiction of Cartagena.

table shows for 1876 the lowest number of deaths, 239 during that eleven-year period. Assuming the population from 1872 to 1880 to have remained stationary (8,603), the 5,163 deaths between 1872 and 1882, which give an average of 469.4 annual deaths, give a total average death rate per 1,000 population of 52 for the eleven years considered. This figure, of course, is staggeringly high. Errors in the taking of the censuses may account for it, and it must be kept in mind that they are not infallible.

Sr. Pineres has concluded Sr. Urueta's statistical data up to the date when the second corrected and augmented edition of *Cartagena and its Surroundings* was finished (1910). He collected the later data from the records kept in the Alcalde's office (Mayor's office), corresponding to the years from 1899 to 1910. He estimates that the population of Cartagena doubles in that period what it was in 1882, but bases his figures on the common base of 20,000 inhabitants, which he claims to be somewhat under the right population figure for the year 1910. Sr. Pineres' figures follow:

NUMBER OF DEATHS BETWEEN 1899 AND 1910, ACCORDING TO SEX BY YEARS

Year	Deaths (all ages) Males	Females	Totals
1899	298	244	542
1900	382	274	656
1901	455	418	873
1902	407	291	698
1903	341	257	598
1904	410	285	695
1905	361	364	725
1906	290	250	540
1907	296	225	521
1908	374	315	689
1909	304	283	587
1910	334	297	631
Totals	4,252	3,503	7,755

Average number of deaths per year for the 12-year period, 646. Death rate per 1,000, 32.3.

The high figure for the year 1901 is due to an epidemic of smallpox. The death rate has fallen from 55 in 1882 to 32 per 1,000 in 1910.

The following two tables taken from page 47 of the same book give the infant deaths and those of the old age groups; for the former 1-5 years is taken; for the latter, 60-110 years.

INFANT DEATHS 1-5 YEARS OF AGE BY YEARS. 1899-1910

Year	Deaths
1899	246
1900	230
1901	375
1902	280
1903	223
1904	242
1905	360
1906	258
1907	245
1908	392
1909	324
1910	315
Total	3,490

Three thousand four hundred and ninety infant deaths is approximately 45 per cent of the total deaths during the 12-year period studied.

The high infant death rate is likely to be due to improper feeding, as the milk supplied to Cartagena is of very poor quality.

The other table which gives the deaths among the people between the ages of 60 and 110 years, gives proof of the excellence of Cartagena's climate, which helped by reasonable personal hygiene, makes possible a high longevity. The city of Cartagena has an undeserved name as an unhealthy spot of "unbearable climate." This is in complete opposition to all facts, the city being a seashore resort, constantly refreshed by the cooling trade winds. The temperature fluctuates between 17°C. and 33°C. The former temperature is reached in the early hours of the morning; the latter at 3:00 in the afternoon. Between 10 o'clock in the morning and 3 o'clock in the afternoon it is hot, but as the people of the city rest between 11:00 a. m. and 1:00 p. m., most of the hot hours can be passed in comfort by those used to tropical living. The evenings, it must be admitted, are delightfully refreshing.

The figures in the table have been carefully compiled by Sr. Pineres:

DEATHS IN AGES BETWEEN 60 AND 110 YEARS CARTAGENA, COLOMBIA

(1899-1910)

Age Group	Deaths
60-70 years	338
70-80	312
80-90	264
90-100	104
100-110	7
Total	1,030

One thousand and thirty deaths of people between the ages of 60 and 110 represent 13.3 per cent of the total deaths.

Of the causes of death the following seven causes made up 47.43 per cent of all deaths in the same twelve years. (Page 48, Pineres).

CAUSES OF DEATH, CARTAGENA, 1899-1910

Causes	Total in the 12 years	Deaths per year
Tuberculosis	608	50
Fevers of several types	1,748	145
Infant tetanus	276	23
Gastro-enteritis	517	43
Dysentery	369	31
Small pox	103	8
Yellow fever	58	5
Totals	3,679	305

To quote Pineres: "Smallpox and yellow fever occurred in 1900, 1901 and 1902; the former in 1901 and 1902 with 32, with 45 cases in 1900. These were years of war (the last civil war in Colombia), and consequently, of much mobilization of troops from the interior of the country, who are the ones who suffer most from the second of these scourges. Between the years 1906 and 1910 there was recorded only one case of yellow fever." This fever, which is the terror of foreigners in Colombia, is a thing of the past and malarial fevers are of rare occurrence in Cartagena.

Epidemics are rare in the city. There was an epidemic of cholera in 1849, which hit Cartagena and many other towns of the Department of Bolivar, and of the interior of the republic. Since then only smallpox, which has broken out from time to time, and "El Tablon" once, have occurred in epidemic form. The 1918 epidemic of influenza also attacked Cartagena with a rather high case rate, but with almost no fatality. This seems to have been due to the warm climate prevailing there, for in Bogota and other cold high latitude places of Colombia, the fatality was staggering.

The writer, after some hesitation, has decided to publish in a foreign country what he knows of health conditions in his own native city. He believes that the light of truth is the best disinfectant for the germ of lethargy which is so prevalent in his home city in matters of public health. He hesitated at first, because, naturally, discussing the health problems of his city, people of non-analytical minds might be led to think that such facts were the only facts to know about Cartagena, without considering that only unfavorable ones (the problems), have been brought out. He submits his observations unbiased even by his deep affection for Cartagena, to which he hopes to return to enjoy his later life.

The Railway Station is in an unimproved section

CAUSES OF TYPHOID FEVER IN MASSACHUSETTS

GEORGE T. O'DONNELL, M. D.,
State District Health Officer, State Department of Health, Boston, Mass.

Read before the Section of Public Health Administration, American Public Health Association, at New Orleans, La., October 28, 1919.

To decrease its typhoid Massachusetts needs now to prevent contacts, use prophylaxis, and educate its citizens in personal hygiene. Municipal water supplies are practically safe. Flies, food (milk excepted), privies and sewage are together only a small factor in spreading the disease. The human contact factor is the one that must be controlled.

IN giving this short paper under this title, no thought is entertained of naming any new or hitherto unknown causative factor. The factors or agencies by which the disease is transmitted are well known already and are, of course, universally the same; that is, water, milk, food and contact with clinical case or carrier. But rather it will be an explanation of why a certain order of importance is given these factors in Massachusetts.

Geographically and geologically, Massachusetts differs from many other sections of the country, and this combination coupled with the fact that public health work had an early start, dating back fifty years, made it possible to settle water and sewage problems for extensive areas. These accomplishments had a most marked influence in changing the relative importance of the causative factors in typhoid fever. Gradually, but certainly, water has been relegated to a position among these factors which gives Massachusetts now very little concern as a cause of typhoid fever.

In 1907 the State was divided into 15 districts, each having a part-time health officer who would serve as a connecting link between local boards of health and the State Board of Health and who would serve as an investigator. In 1912 the number was reduced to 12 districts. In 1914 a reorganization of the State Board of Health took place and the State Department of Health was established with a Commissioner, and the state divided into 8 districts, each with a full-time District Health Officer. This group was made up largely from the previous appointees and they, with their experience, carried out the recommendations of 1913 which resulted in intensive work on all typhoid case reports.

In 1914 a regulation was passed by the State Department of Health demanding that all typhoid fever cases as well as certain other milk-borne diseases, be reported at once if on the premises of milk handlers or producers.

This investigation is promptly and thoroughly carried out by the local boards of health and State District Health Officers and the part played by the carrier brought into the light.

It seems well to speak of the above in the fore part of this paper because of the fact that a pure water supply and adequate sewage disposal facilities are absolutely essential to the prevention and control of typhoid fever.

WATER

In 1848, just 21 years before the creation of the Massachusetts State Board of Health, the first metropolitan water sup-

ply was established at a point about 15 miles from Boston; a secondary or supplementary supply was completed in 1873, and these were added to at different periods up to 1898 when the Great Wachusett Reservoir, 40 miles from Boston, was finished. These great storage basins with their protected watersheds deliver water by aqueducts to distributing reservoirs at given points near the city. By this means, from storage reservoirs, water is supplied to what is practically one-third of the population of the state.

Should pollution, in the shape of typhoid fever infection, find its way into the water supply from some point on the water-shed, by the time this water reached the consumer no infection would probably be present; as it has been proven conclusively that one month, with its exposure to the sun, and accompanying natural and chemical precipitation, plus the fact that germs do not propagate in storage water, spell death to the infection of typhoid fever.

This plan or similar plan of public water supply has been carried out by most of our large cities and towns, and has resulted in a marked decrease in the incidence and death rate in typhoid fever. In recent years, dating from 1896, we have had no series of typhoid fever cases blameable to public water, with one exception, and that occurred in one of our cities which uses a filtered supply from a much polluted river. This was due to the freezing of the filter beds which allowed polluted water to enter the municipal water mains.

We still have in our rural districts the problem of the well water and the neighborhood pump. The continued examinations of our water laboratories bring out the fact that practically all of these are polluted, either by a privy on the premises or by very poor sanitary arrangements about the well head. They often are easy of access to the public and are used as a place to wash hands, the drip-water returning to the well. There sulting in 22 cases, both of these occurring during the past summer.

SEWAGE

For the most part, those cities and towns which operate public water supplies, have also established concomitant sewage disposal plants which, of course, in a complementary way reduce to a very great degree the possibility of the pollution of the home and other water supplies. All of the municipalities bordering on the ocean dispose of the sewage by discharging it into the sea at a suitable distance from the shore. In addition, many inland towns, such as those in the metropolitan area, also empty their sewage into the sea by trunk sewers.

The rural community which gets its drinking water from private wells, has also the much complained of overflowing cesspools and privies, and therefore, as stated above, we still have present with us this condition which is slowly but surely improving due to our efforts in an educational way. This will be considered later.

MILK

In 1913, after much study and thorough investigation, there was recommended, and a year later established, a routine epidemiological investigation of each individual case of typhoid fever, using a special blank form upon which was recorded all data considered important. When a number of cases, sufficiently large to study, had been reported on these forms, the degree of importance attached to each factor was brought to light and the cause of milk infection was revealed. During the period of years 1915 to 1918, inclusive, the attempt to investigate every case was usually successful and 496 cases out of 6,331 were found to be due to the agency of milk, but only in one instance was an outbreak proved to be due to an acute case. This outbreak numbered 22 cases, and 46% of these milk-borne typhoid fever cases in this period were proven to be due to

milk infected by a carrier. For the last are some cases of typhoid due to such infected water, among them a well which caused 11 cases and a public spring re- 10 years, only 8.1% of all the typhoid fever cases proved to have been milk-borne.

In 1918, 48% of our milk infection by typhoid fever bacilli was proven to be due to infection by carriers; but in the remaining 52% of the cases no clinical case was found and the milk was probably infected by carriers.

In order that some of the matters just referred to may be made more clear let me explain that a State Board of Health was established in 1869, and long years passed when there was little or no co-operation on the part of local agencies and during which time reported typhoid fever outbreaks had to be looked into by special investigators. With no knowledge of the Widal and with no laboratory facilities such as now prevail, it can readily be seen that the march of progress in Massachusetts as in other sections was slow and tedious during the early years.

CARRIERS

As nearly as can be ascertained, about 2% of all typhoid fever victims become carriers. This seems a small percentage. In the last 10 years, 41 permanent carciers have been found. This also may seem small, but when you learn that in the period of years, 1910-1914, 3 of these carriers were responsible for 125 cases of typhoid fever and from 1915-1919, 14 carriers caused 249 cases, a picture quite different is shown.

It is interesting to note that 18 of the 41 carriers were found as a result of outbreaks of typhoid fever among customers of dairies and on milk routes. The carriers infecting milk were in each instance permanent carriers; that is, they had the disease several years previous, one carrier giving a history of typhoid 45 years previous.

The temporary carrier is undoubtedly a greater source of infection than is at present realized and a cause of many of the typhoid cases of unknown origin. It is possible that in the near future two or more negative fecal and urine examinations may be required from convalescing cases to determine whether cases are carriers or not. This is now done in several of the large hospitals in Massachusetts.

CONTACT WITH THE CLINICAL CASE

This infection takes place usually because of ignorance of personal hygiene on the part of the attendant or nurse. Failure to wash and disinfect properly the hands after tending a patient before handling food used by others is the direct way of infecting self and others. The returning of infected milk bottles to a non-infected supply, the failure to disinfect stools properly and depositing same where flies predominate, are also common methods of securing secondary contact.

HOUSEHOLD CONTACT

The case records in a group of 556 cases furnished an indication of the number of persons constituting a household, the total being 3,051 individuals, or five persons to the household.

Considering that there were but 98 secondary cases in these households, it is rather a good showing, but a closer study shows that over one-half of these cases had their onset three weeks or more after the onset of the primary case. Also 31 families had two or more cases, one family having five and another seven cases.

The use of typhoid prophylactics on all the members of the household at the appearance of the first case would have prevented some of the secondary cases. It is this phase of typhoid infection which has proved to be unsatisfactory and difficult to deal with in our state. We are hoping that the educational work in the state will soon make the use of

the typhoid vaccine in families more welcome and decrease the secondary cases in households.

EDUCATIONAL WORK

The State Health Department carries on throughout the year a program of illustrated lectures given by District Health Officers and public health nurses in which the story of public health is carried to the cities and towns, especially the smaller ones. By the use of illustrated talks, the method of transmitting infection, what contact really is, the elements of personal hygiene, clean handling of food and milk, the knowledge of the Widal Test and immunization are impressed upon the community life throughout the state.

Many of our small towns of from 1,500 to 5,000 inhabitants have seen fit to employ public health nurses who devote their entire time to public health and school work. The larger places, without exception, have one or more nurses who are performing a high order of work. This group is being increased constantly, and a plan is now being put into operation which will bring nursing activities to every corner of the Commonwealth.

This feature is mentioned because it is certainly one of the influences which is responsible for the decrease in the incidence of typhoid fever in Massachusetts.

MORBIDITY AND MORTALITY

As a result of the intensive work mentioned the following statistics are of interest:

The morbidity rate in Massachusetts has decreased from 102.1 cases per 100,000 of population in 1910, to 27.2 cases per 100,000 in 1918. Likewise, the mortality rate has decreased from 12.2 deaths per 100,000 in 1910, to 4.0 per 100,000 in 1918.

CONCLUSIONS

(1) The experience of the Massachusetts State Department of Health shows that flies, food (exclusive of milk), privies and sewage, are relatively a small factor in the spread of typhoid at the present time in the state.

(2) There are very few cases due to water, especially in recent years, and in general no municipal supply is considered as a dangerous source of typhoid infection.

(3) Milk as a means of spreading typhoid infection was responsible for 8.1 per cent of the total cases reported in Massachusetts during the past ten years.

(4) Contact with clinical cases of typhoid is the most frequent known method of spreading infection. Contact with known carriers has been responsible for a few cases in homes and neighborhoods.

(5) Carriers were proven to be responsible for 41.6 per cent of milk-borne typhoid in 1915 to 1918, inclusive. Carriers are a larger factor in the spread of typhoid than at present known, and are a cause probably of an appreciable number of typhoid cases of unknown origin.

(6) The early establishment of water supplies and sewage disposal plants was a fortunate thing for Massachusetts in eliminating polluted water as a factor. Finally, the prevention of typhoid fever in Massachusetts can be summed up under the following procedure; namely, investigation of the individual case; educational work, particularly along lines of personal hygiene and a more widespread use of immunization.

The A. P. H. A. Meeting at San Francisco is only two and one-half months away!

September 13-17, 1920.

Plan your vacation so as to be there!

SELF-IMPOSED INSPECTION OF THE NATIONAL CANNERS ASSOCIATION

H. M. Loomis,

National Director of Inspection, National Canners Association, Washington, D. C.

Read before the Food and Drugs Section, American Public Health Association, at New Orleans, La., October 27, 1919.

Here is where the manufacturers on their own initiative have instituted inspection to improve, standardize and certify their own canned products. The public health aspects are important and include good original material, proper processing, supervision of health of employees and improved sanitation of factories.

A DETAILED description of the National Canners Association inspection is beyond the scope of this paper, but in brief it is a voluntary movement on the part of canners in this country to secure some disinterested and competent agency to inspect their canneries and canning operations for the purpose of bringing the former up to high standards of sanitation, and of raising the average quality of canned foods produced in such canneries.

Subscribing canners sign an agreement with the National Canners Association that they will pay an assessment to defray the expense of inspection and that they will abide by the rules and regulations of the Association. The inspection is conducted without profit to the Association.

Minimum standards of quality are being established, and canned foods which come up to or exceed these standards, and which are packed under the sanitary conditions required, are entitled to receive the certificate of the Association showing that they are packed under its supervision, in accordance with its regulations.

These standards which provide for a clean, attractive and palatable can of food, are prepared by the inspection service, and, being tentative in character, can be revised when necessary with comparatively little trouble. Such standards have already been adopted for canned sardines, corn, tomatoes, string beans, lima beans, peas, pumpkin, sauerkraut, spinach and fruits. One of the rules for certification provides that "Beginning with the output of 1920 in all cases where a standard grade has been or shall be adopted by the Joint Committee on Definitions and Standards of the U. S. Department of Agriculture, the minimum standard for certification shall not be lower than such standard grade." Products falling below those standards will not be certified and in that way is to be attempted the gradual elimination of the poor quality goods which injure the market for canned goods.

The canners, in order to keep in close touch with the inspection service and the director of inspection, elect an advisory board from among their number, to advise the director on matters relating to the inspection. The directors of inspection, however, are appointed by the executive officers of the National Canners Association to whom they are alone responsible, and they in turn have entire charge of the appointment of their assistants and of questions relating to certification.

INSPECTORS AND INSPECTION METHODS

The inspection service of the Association has been divided into districts, and each district is in charge of a director of inspection appointed, as

already stated, by the National Association. Eleven such directors have so far been appointed and nine of these have had long experience in either federal or state food inspection work. The other two are men thoroughly trained in scientific and practical canning. Under the Association rules, no relative of a canner nor any one financially interested in an inspected cannery can hold a position on the inspection force.

This inspection plan originated at a meeting of the officers of the National Canners Association with representatives of the Marine Sardine Canners in February, 1916. The meeting was called at the request of the latter to organize for the good of the industry and to ask the Association to put into effect some plan of inspection by which the average quality of the Maine sardine, as well as sanitary conditions in the factories, could be improved. A large majority of the Maine canners signed an agreement to live up to such inspection rules as the Association might adopt, and to pay an assessment on each case of cans bought by them. About two-thirds of the Maine sardine pack are put up under this inspection.

The plan was later followed out substantially in the inspection service for the California sardine industry, and for the fruit and vegetable canners inspection begun in Southern California in 1917, and in Iowa, Illinois, Wisconsin, Indiana, Ohio, Michigan, and New York, in 1919.

The Pacific Coast salmon industry has largely adopted this form of inspection, but owing to the difficulty of access to the various Alaska canneries and the lack of sufficient men trained for the work, the service this year has been limited to a thorough sanitary survey of the canneries, followed by recommendations from the Director of Inspection that will make it possible for each cannery to operate next year in accordance with the sanitary requirements of the Association.

The whole plan may still be said to be in its infancy and many important details remain to be worked out or perfected.

This inspection will not be realizing all that is expected of it if it does not bring about a permanent improvement in standards of quality and sanitation. Only thus will the canners derive any lasting benefit from it, and far-sighted men in the industry see this and have refused even to ask for the certification of goods which they do not believe to be of suitable quality.

They realize that if such goods go out to the trade bearing the certificate of inspection, the harm done to the inspection, in the success of which they are vitally interested, will far outweigh any possible temporary advantage from such certification. Such abuse of certificates will prove a boomerang affecting not only the individual canner responsible, but all the canners who are backing this movement.

In some states so noticeable has been the improvement in quality effected by this inspection that buyers are demanding certified goods and many canners indicate the fact of such inspection on their invoices. It has been found in many districts that there is a decided reduction in the losses due to spoiled cans since the inspection was inaugurated.

To quote a sardine canner who has been connected with the inspection from the beginning: "Our sardine canning factories are in a much better condition than they were three years ago—neater, cleaner and much better kept in every way and there has been a decided improvement in sanitary conditions in and about the factories. The raw material is handled in a clean and sanitary manner, and a better article is being produced.

"As a result of the inspection system the men engaged in our industry

have confidence in their product. They know that the packers who are under inspection are putting out good sardines. They know that none of the members of the Sardine Section are packing and selling sardines that will injure the industry generally. We know that the jobber and the retailer have more confidence in Maine sardines knowing that they are packed under inspection, because as a result of the three years' working of the inspection system they have come to know that sardines bearing the certificate of the National Canners Association are good sardines."

This letter expresses the effects of the inspection from a canner's viewpoint.

I desire here to make clear that before this inspection was started there have been and there always probably will be canners who maintain high standards for cannery conditions and quality of products. In most cases such canners realize that anything which will tend to place the industry on a higher plane will be of benefit to them, and they have been among our most loyal supporters.

Since the beginning of the inspection service the only form of certificate issued has been one to be attached to each case of approved canned foods and worded substantially as follows: This certifies that the product contained in this package has been packed under our supervision in accordance with our requirements. Signed National Canners Association and giving the name of the Director of Inspection.

However, the case certificate alone does not fully meet the wishes of the canners. Such certificates do not come to the attention of the consumer, except in rare instances, and if they did he probably would not know what they implied. Furthermore, as this inspection is rather a process of gradual evolution than an over-night revolution, by force of competition and example many of the canners who are outside the inspection and who had been in the habit of putting out poor quality goods and operating insanitary factories, have been compelled at least to approximate the minimum quality set up by the inspection service and the sanitary conditions required thereunder.

The canners under inspection feel that to get the greatest benefit out of this inspection, and, to some extent, reimburse them for the large added expense under which they are operating, the certificate of inspection should appear on each can, so that it will reach the consumer. Then by a properly conducted campaign of education and publicity, the consumer can be induced to demand certified products. The working out of such a plan for some form of certificate or emblem on each can of food approved by the inspection service, is contemplated during the coming year.

SANITATION

The general sanitary requirements are about 30 in number and are based on the Association's experience and on sanitary laws. They provide for cleanliness of factory, utensils, raw materials and product, also for sanitation in habits and dress on the part of employees. In addition to this, in each branch of the industry special rules may be made which are applicable to that particular industry. In some instances, canneries have been dark and dreary places with a consequently depressing effect on the workers. The liberal application of white paint in such places has a marked effect on the feelings and attitude of the employees, and I have never yet found a case where a canner regretted the outlay of money for that particular purpose.

It is evident from the experience of the past three years that most canners do not realize at first that this inspection is not simply restrictive, but may be helpful and constructive in character, depending on their attitude to-

ward it. Of course, in work of this sort much depends on the tact and common sense of the inspector, but the fact remains that while at first packers were apt to regard the inspectors with suspicion, and complaints were frequent that the inspectors spent too much time around their factories, there has been a steady and notable increase in the number of canners who desire closer and more continuous inspection by the Association. If that feeling becomes general, there will be almost unlimited possibilities for the extension of the service. Canners will realize that the inspection is a great help to them and that as they are paying for it, anything they may do to cripple it or to impair its usefulness will ultimately injure themselves.

Many canners have admitted that the spirit of competition or emulation stimulated among their employees by this inspection has been of great benefit to them. They are glad to have an inspector come in, and in a helpful way call attention to things which would easily be overlooked by the cannery management, particularly during the height of the canning season.

It was estimated last spring that about one-fifth of the total pack of canned foods would be packed under Association inspection this year, but the latest figures indicate that about one-third of the 1919 output will be so inspected. Certificates will not be issued in some districts on account of the delay in starting the inspection.

Several questions naturally arise in connection with this form of inspection which is not backed up by force of law, but merely by the pledged word of each canner signing the inspection agreement. How can the inspection be made really effective and how can the rules be enforced if a canner declines to live up to his agreement?

The answer to this is that the canners are putting their own money into this plan, and that means they wish it to succeed. All, or nearly all, of them realize that it cannot succeed unless the rules are lived up to and the use of the certificate is safeguarded. To have poor goods go out under certificates will make the certificate of little value in the eyes of the buyer, and that makes it as important a matter to the canner as to each inspector that certificates should only go on goods that will be a credit to the industry.

The publicity to be given to the certified goods by the campaign planned will make certificates of real value and the possible loss of certificates on any lot of goods will be another incentive to canners to live up to the requirements.

This movement is not wholly a new idea. Probably the best known effort of a similar kind is that of the California citrus fruit growers, who formed a non-profit organization to make possible more efficient and prompt marketing of their perishable products and to standardize the quality of the latter when sold under copyrighted and extensively advertised brands. At the head of that organization was placed a scientifically trained man of proven executive ability who was experienced in fruit growing.

Two or three state laws have recently been framed providing for state inspection and certification of canned foods; in other states similar legislation is contemplated.

SCIENTIFIC WORK

In any attempt to put into effect a constructive system of inspection, account must be taken of scientific methods for controlling both the factory operations and the quality of the finished products, for the canning industry is based fundamentally on the science of bacteriology, with a less direct application of chemistry, physics and engineering.

The Research Laboratories of the Association in Washington under Dr. Bigelow are well equipped to handle

most of the problems relating to the industry, but it is felt that smaller field laboratories in connection with the inspection offices would fill more exactly the local needs. Consequently, such laboratories have already been established in Maine and in California, and close connections with state or commercial laboratories have been established in four other districts. These laboratories are prepared to handle such problems as those relating to sterilizing or processing, quality of raw material, examination of finished products, accumulation of data on which to base definitions of grades or standards, proper fill of cans, and methods of retarding deterioration in case of perishable raw materials.

If this plan is to be a permanent success, it will not be bound down to certain limited and prescribed functions, like inspection, either state or federal, under the Meat Inspection Act or the pure food laws. Such official inspection is based on certain minimum standards of quality and sanitation below which a producer cannot fall without violating the law. Canners Association inspection, however, must continue to grow and develop along constructive lines.

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VALUE OF PLANT RECORDS IN THE DEVELOPMENT OF PLANT HYGIENE

A. R. HACKETT, M. D.,

Delray Industrial Hospital,
Detroit, Mich.

Read before Section on Industrial Hygiene, American Public Health Association, at New Orleans, La., October 28, 1919.

PLANT medical records can be of much service in developing plant hygiene. A great many varied hygienic conditions are met with in industry. These vary according to different working conditions and also to the working conditions found necessary, or more often unnecessary in producing the product peculiar to the industry, such as lead poisoning, gas poisoning, T. N. T. poisoning, and so forth. These I would classify as preventable accidents, rather than occupational diseases. There are, however, a large number of conditions and diseases that may be traced to poor plant hygiene and there are also an equally large, or even larger number, of diseases that can be traced to personal hygiene rather than to any condition connected with the plant. To differentiate between these two is an all-important problem and in order to do it with any degree of accuracy some very careful work must be done. Records in themselves amount to very little as evidenced by the various forms of records used and there has been very little attempted at standardization. Recently I read of one plant which claimed to have obtained better results from their work by keeping absolutely no record of their sick cases whatever. This, of course, is carrying things to an extreme but I do believe, however, that the simplest form of records possible will accomplish the best results.

We have been surprised to find how many so-called occupational diseases, which are often blamed on poor plant hygiene, have, when a thorough history has been recorded and the laboratory findings tabulated, been found to have their origin in something entirely foreign to any condition connected with the plant. For instance, to find how many general systemic conditions can be traced

to focal infections, such as diseased tonsils, abscessed teeth, and so forth, each case must be handled individually and the proper diagnosis aimed at.

It is an obvious fact that all hygienic supervision of the plant should originate in the medical director's office, and it depends largely on the records he keeps and the thoroughness with which they are worked out, whether they will be of very much value in this connection. In too many instances the medical director is called upon to do all the detail work of not only seeing all the sick and accident cases personally, and making all physical examinations, but has to do the clerical work as well. Naturally he has to be as brief as possible with this part of the work and will overlook a great many facts that are of vital importance in making the correct diagnoses and amassing accurate data that will help solve the hygienic problems of the plant.

To prove what I am saying, I want to cite several concrete examples that came under our observation recently.

The first case was that of Mr. L., an employee of the company for over 15 years, who had been working around the coke ovens for most of that time, and who had been subjected to coal gases—given off during the manufacture of the coke. He had reported at the dispensary on various occasions with indefinite symptoms, for which he received treatment, but which did not clear up. He was brought to the hospital with the impression that he might be suffering from a chronic gas poisoning. A thorough history was obtained and laboratory findings tabulated, which resulted in showing that the man gave a positive Wassermann and that he was suffering from cerebrospinal lues from which he died very shortly. This case could have been very easily overlooked, without the proper laboratory work being done, and could have been classified as one of several occupational diseases.

The second case was that of a Mr. P., a man who had been but recently employed with the company, but who had reported at the dispensary for an injured ankle which he said had been received before being employed by us, but which he claimed was being aggravated by the kind of employment he had, as it necessitated his standing on his feet for a greater part of the time. He was brought to the hospital and given a thorough examination and laboratory tests applied which resulted in showing that he had a Charcot joint following a syphilitic infection. This ultimately necessitated amputation of his lower limb.

The third case was that of an engineer on one of the yard locomotives. He had been in our employ a long time and came into the hospital suffering with pain in his lower spine. We immediately thought he had an "engineers spine" and that we had a true occupational disease to deal with. However, during the course of general examination it was found that his teeth were in very bad condition and he was advised to consult a dentist. The dentist reported that nearly all of his teeth were abscessed at the roots. This again ruled out the occupational disease and put the diagnosis where it belonged.

The fourth case was that of a foreign employee who had reported at the Dispensary on several occasions complaining of indefinite pains in the abdomen. He also thought his work was too heavy for him and that a change of occupation would relieve his condition; however, during the examination it was found he was suffering from a severe pyorrheal infection and several of his teeth were loose. An X-ray of all his teeth was taken which resulted in showing that not only were some of his teeth abscessed at the roots but that a large percentage of them were partially eaten away and his gums in general were badly infected. Here again lay the cause rather than in an ulcerated stomach or heavy work. A man with a chronic infection like this is not able to do real work.

The old type doctor might truly be called an "all-around man." He at-

tempted to do everything in the way of diagnosis and treatment, and often times surgical as well. As I have mentioned earlier in this paper this is the type of work that has characterized a great deal of the industrial medical departments in the past.

In order to do this work properly it has been our experience that not only is it necessary to have a competent medical staff and plenty of clerical help devoting all of their time to this work, but to have as well, a thoroughly modern laboratory and X-ray equipment with trained technicians in charge.

In a large number of the states the so-called occupational diseases are being put on the same basis as the industrial accidents. This will lead to a great number of these cases getting before the Industrial Accident Boards. In order to show that the plant hygiene is or is not responsible for them it will be absolutely necessary that accurate records be kept and sufficient clinical and laboratory findings tabulated to show beyond a doubt what the correct diagnosis is.

This, however, is an expensive proposition and is beyond reach of the average small plant. The best solution to this, in our experience, would be to have several institutions in a given community join together and recognize and support a thoroughly equipped diagnostic clinic for this very purpose.

This, we believe, would not only save the companies themselves a large amount of money but would also save the individual much unnecessary medical attention and time lost in undergoing treatment which in a great many instances, if an early diagnosis had been made and the proper treatment instituted in the beginning, would have quickly cleared up the cases.

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WORLD-WIDE WORK OF INTERNATIONAL HEALTH BOARD

AUSTRALIA

Here is a group of Australian aborigines assembled for hookworm examination and treatment. These people were thought to be only lightly infected, but the campaign conducted by the State of Queensland with the assistance of the International Health Board has disclosed a high rate of infection (from 60 to 100 per cent) among them. Arrangements for their systematic treatment are being made.

RESUME OF METHODS FOR CONTROL OF MALARIA: INDICATIONS; RESULTS; COSTS

H. R. CARTER,

Asst. Surgeon General, U. S. P. H. S.,
Baltimore, Md.

Read before General Sessions, American Public Health Association, at New Orleans, La., October 29, 1919.

Eighty to ninety-nine per cent reduction in physicians' calls to malaria patients has been the result of malaria control work in the South. The author notes that there is no set rule for all localities. Cost is a factor not to be ignored. Quinine is sometimes necessary, but usually mosquito control is adopted.

Knowledge of the mechanism of the transmission of malaria gives us the key to its control—*i. e., to prevent access of infected Anopheles mosquitoes to men.* For this our methods are:

(a) Get rid of Anopheles mosquitoes.

(b) Prevent the infection of Anopheles mosquitoes.

(c) Prevent access of any Anopheles mosquitoes to men.

Sufficient control of either host, human or insect, will control malaria.

For (a) we aim to prevent the production of Anopheles;

(b) to free all men in the community from malaria parasites;

(c) to keep men behind screens and mosquito bars during the flight of Anopheles.

I do not mention hand-catching of Anopheles in residences, or the use of quinine to prevent infection in the person taking it. The former is an efficient but little used and rather troublesome method of control; the latter has never been tried out in the United States and, although it unquestionably has given good results in Italy, Greece, Algiers and some other places, it seems to me rather a makeshift to be used until other measures can be instituted. It is however a makeshift I have used a few times, I believe, to my great personal advantage.

The first and second are community measures; the third may be either community or individualistic. The first implies control of the insect host, preventing the infection of man; the second, control of the human host preventing the infection of the mosquito; the third prevents both the infection of men—if the mosquitoes screened out are infective—and the infection of mosquitoes—if the men screened in are infective. (The action of hand-catching is analogous to screening.)

METHODS

Of the three methods, which is the best? There is no best method, or rather each of them is best under certain conditions. You do not ask what is the best laxative or the best stimulant! What is best under one set of conditions is not best under another.

I will say however, that where practicable, community measures are in general preferable to individual ones, just as it is better to sterilize the water supply for a city than to trust to individuals to do so, each one for himself. Yet if the city fails in this duty, that man is wise who boils his own drinking water. If community control is not enforced, protect yourself.

We will then compare only the two community measures. Until today at

least, I expect you have heard mostly of the method by mosquito control, applied first by Ross at Ismalia; by Gorgas around Havana and on the Canal Zone, and, since 1914, by others in many places in the United States. Obviously, preventing Anopheles production is absolutely effective in controlling malaria. Often has it been so proven both here and abroad. And it is always physically possible to control the production of Anopheles. Why then should we consider any other method? Because this method of control is not everywhere possible within the *allowable limits of cost.* Some other method may be.

Now here I think I *can give you the* best method of Malaria Control or rather criteria by which you may in any given case determine it: *That method is the best which gives sufficient control of malaria at the least cost,* or, what is the same thing, *which gives greatest and sufficient control for the same cost.* It seems to me that all working sanitarians will agree with me here. Economy in sanitary measures is to be considered equally with their efficiency. To spend $1.00 for a result obtainable for 80 cents is not only bad business, but bad sanitation. We may even pay too much for sanitation. We speak of health as "priceless." This is hyperbole. Health has a money value and to spend $1.00 and gain 80 cents worth of health is again bad sanitation. I think we have usually gotten at least $10.00 worth for every $1.00 spent in malaria control.

The values of the different methods are then accurately proportional to the ratio of the benefit received to the cost; or, as it might better be expressed, of the injury removed to the cost. Obviously the number of people benefited multiplied by the percentage of the reduction of malaria among them expresses the benefit.

The advisability of methods then and their proportionate value to the sanitarian, may be measured comparatively by the fraction at the bottom of the page.

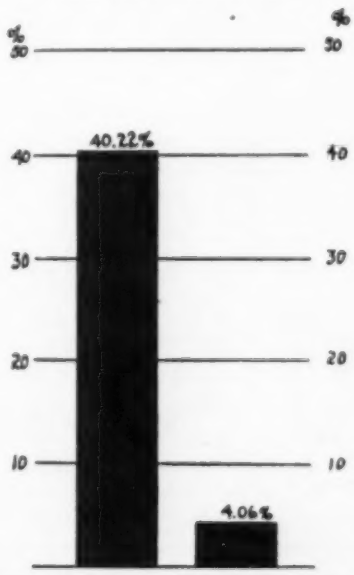
This fraction we take then as the measure of the value of our method.

The numerator of the last fraction is the injury removed for the average man, and the denominator, the cost to him for so doing; hence, the fraction represents his proportionate gain. Cost includes all expenditures in money, time and inconvenience, first cost and upkeep. Permanence of result is considered in percentage of control.

CHART I

CONTROL OF MALARIA IN SUNFLOWER COUNTY, MISSISSIPPI, BY CURING INFECTED PERSONS

Mississippi State Board of Health



Reduction in prevalence of malaria in a 100 square mile area in Sunflower County, Mississippi, 89.9%, following intensive malaria control work in 1918. (The tall column represents the proportion of the total population who had attacks of malaria during the twelve months previous to the first survey and treatment, and the short column the proportion who had attacks during the twelve months following.)

INDICATIONS FOR THE DIFFERENT METHODS

Now it is obvious that in the method by control of mosquito production the cost will in general vary roughly with the

$$\frac{\text{Number of people benefited} \times \text{percentage of malaria reduction}}{\text{Total cost}} = \frac{\text{Percent of Reduction.}}{\text{Cost per head.}}$$

extent of the area requiring control and that therefore, the "Cost per head," the denominator of our last fraction *increases and decreases inversely to the density of the population.* This fraction then, the measure of the value of the method to the sanitarian, varies directly with the density of the population, the number of men per unit of area. This method then is generally less suitable to thinly settled farming communities than to villages and thickly settled communities. The difference of applicability does not obtain for the method by freeing infected men from parasites. Also, of course, the cost of control of the unit of area has to be considered in judging of the suitability of the first method. It may be prohibitive, as was the case at Lonoke, Ark., where even for a village we depended on the sterilization of the human host. A survey of the place where we purpose control to show the cost of the work and the probable control obtainable, is a necessary preliminary to a choice of methods.

Let me call your attention to one point in the last four Arkansas charts, (See Chart III) viz., the diminution of malaria in 1918 prior to the possibility of it being affected by the control measures. This means that in the early part of the season of 1918 malaria was naturally less prevalent than in previous years. Indeed, Taylor says that the year was less malarious than usual. LePrince, working at the camps in Miss., Ala., and at Memphis finds the same condition and I judge we should allow a certain part of this reduction to 1918 being less malarious than usual in this part of the South. It is these places which should be compared with the Sunflower work because (1) it was the same year and (2) each involves only one year's reduction. Those preceeding them are valuable as showing how the control has invariably been kept up.

RESULTS AND COSTS

The Method by Quinine Sterilization given in a Farming Community:

Place	*Population*	*Years*	*Reduction* *Blood Index*	*Physician's calls*	*Cost per head*
Sunflower County, Miss.	8,000	1917-18	....	89%	$1.16*

*See Chart I.

THE METHOD OF CONTROL OF MOSQUITO PRODUCTION:

Place	*Population*	*Years*	*Reduction* *Blood Index*	*Physician's calls*	*Cost per head*
Roanoke Rapids, Va.	4,100	1913-16	97%	99.33%	$0.80 for 1914
					0.27 " 1914
					0.24 " 1916[1]
Electric Mills, Miss.	1,000	1913-15	91%	85%	1.21 " 1914
					0.24 " 1915[2]
Crystal City, Mo.	8,000	1915-17	83%	80%	0.90 " 1916
					0.54 " 1917[3]
Crossett, Ark.	2,029	1915-18	....	97%	1.24 " 1916
					0.63 " 1917
					0.53 " 1918[4]
Hamburg, Ark.	1,285	1916-18	....	97.4%	1.45 " 1917
					0.44 " 1918[5]
Lake Village, Ark.	975	1917-18	....	94.8%	1.25
Dermott, Ark.	2,760	1917-18	....	87%	0.54
Monticello, Ark.	3,023	1917-18	....	89.8%	0.46
Bauxite, Ark.	2,500	1917-18	....	78.4%	1.11

1. "We count ourselves free from malaria." says Dr. Long, Health Officer. See Chart II.
2. "Two-thirds of the cases reported in 1915 contracted elsewhere." Dr. Champenois, Health Officer.
3. Reduction given for 1916 only. "75% of cases reported in 1916, relapses from 1915." Statement of Health Officer.
4. Reduction first year 72½% blood index; 70.4% calls.
5. First year 89% reduction.

Similar work has been done, and with similar results, at Dallas, Tyler, Lufkin, Keltys, Sherman, Marlin and Waxahatchie, Texas, Emporia, Kress, and Wilson, Va., and some other places.

At Wilson a 100% reduction was obtained—a fluke of course—but malaria *was* eliminated in a single year. Wickliffe Rose states the same to have been the case at Ruleville, Miss., where both methods were used, although "control was based in the main on anti-mosquito measures."*

CHART II

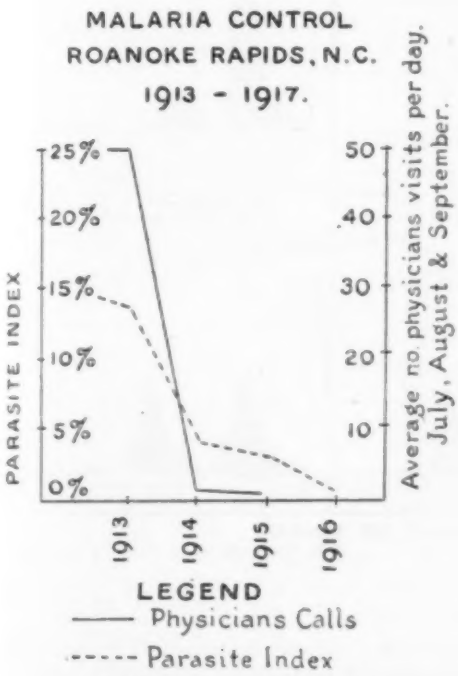


Table to Go with Chart II

Parasite Indices.

Oct.,	1913	13.75%
"	1914	4.48%
"	1915	3.51%
"	1916	0.53%

Physician's Calls.

Average per day for July, August and September.

1912 and	1913	50 per day
1914		3 " "
1915		⅓ " "

Costs.

1914		80 cents per capita
1915		27 cents " "
1916		24 cents " "

Both methods then give excellent results. They are not rivals—they supplement one another. Their indications are different. The first is especially applicable to a thickly settled community in which the cost of control of mosquito production is not excessive; the second to one more sparsely settled in which the control of production is excessive.†

Of the two community measures the first, where applicable, has some advantages, in that:

(1) The main work is done usually once for all, the up-keep is usually small—and in fact has, I think, always been kept up.

(2) The work is done with materials; earth, water, etc., not with people. Health officers well know that no material is as refractory to work with as people.

(3) Both the installation and upkeep are carried out directly under the supervision of the health officer and the result cannot be vitiated by individual carelessness, crankiness or bad faith.

(4) It is independent of the movement of the population into the controlled area from an infected one.

(5) Getting rid of mosquitoes as a pest is of no small advantage.

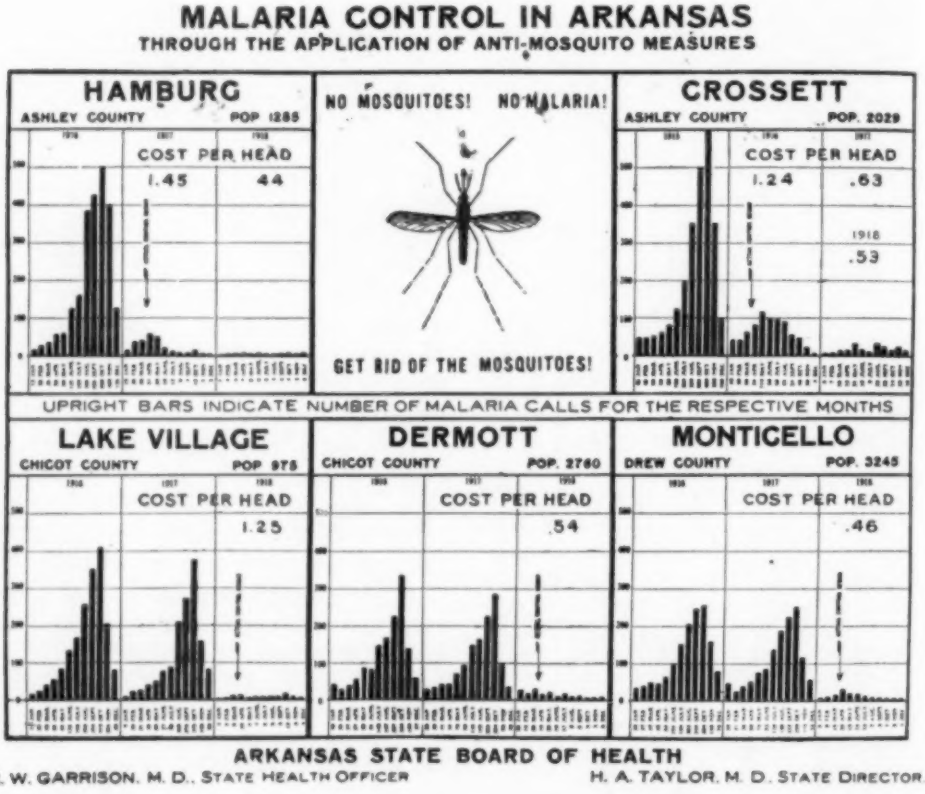
In many places, however, the method by quinine sterilization is the only one practicable, as a community measure. Then, of course, there can be no question of choice. It has also the advantage, and it is no small one, of preventing all relapses from infections of the previous year and of curing any infections due to Anopheles which have hibernated, neither of which are affected by the control of mosquito production at the time it is usually undertaken. It needs a painstaking, forceful and tactful administrator and director. It is best suited for a community either very biddable or

*Gilmerton, Va., and Red Leaf Plantation, Miss., were treated by screening, with good, but not brilliant results, i.e., the first cost was high.

†The individual protective measures—screening; hand-catching and immunizing quinine are to be used in case community measures are not practicable.

very intelligent and well instructed. In the South I would take my chance with the country negroes as being the first rather than with the white farmers as being the second. The immediate results have been most excellent. Time will show how permanent are its results and its cost of upkeep.

CHART III



Health Rules for Tuberculous Cases in Training.—Turner declares that the arrested case of consumption may become well from three to four years through the system propounded. His rules are: (1) Follow the simple life (regularity in eating, sleeping, working and playing; take plenty of time; don't hurry; make life a social event). (2) Sleep in the open air at least nine hours a day and in air which is in motion. (3) Limit work hours according to effects. Most inside jobs are suitable; most outside jobs are not—because they require too much manual labor. "Seek to accomplish the most work with the least amount of physical effort." Dusty and unsanitary places must be avoided. (4) In regard to play, take recreation of a quiet sort such as golf, croquet and short walks. Avoid active physical play like dancing, tennis, skating, swimming, hunting and horseback riding. Avoid gambling, as the mental excitement is too great. (5) Learn the danger signals of relapse: a sense of fatigue, loss of appetite, loss of strength, loss of weight, rise of temperature, night sweats, increased cough and sputum, spitting of blood and rapid pulse. Weigh yourself every two weeks. Cultivate a cheerful disposition; be an optimist; when in doubt consult your physician. Surgeon John W. Turner, *Vocational Summary*, March, 1920, pp. 204-206, *Federal Board for Vocational Education*, Washington, D. C.

NUMBER OF BACTERIA ON THE LIPS OF MILK BOTTLES AND THEIR SIGNIFICANCE

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Read before the Laboratory Section, American Public Health Association, at New Orleans, La., October 30, 1919.

This communication proves to be a good argument in favor of the outside paper cap that covers the whole top of the bottle and is held on by a ring, although no mention is made of it. Possibilities for contamination of milk bottle lips under current methods of handling are set forth quantitatively as a help to the education of the public.

ONE of the principal aims of present day sanitation is concerned with the placing of a safe and clean milk supply before the consuming public. Much enlightenment regarding the importance of various operations, such as production, cooling, pasteurization, bottling, etc., has come about through laboratory findings. One of the factors which is of prime importance from a public health viewpoint and which has apparently been somewhat slighted in the past, is the cap and lip of the milk bottle. Unclean hands may deposit dangerous germs upon the cap or lip of the bottle; flies may carry their filth there: cats and other animals often lick the upper part of the bottle; finally street dust, with its varied bacterial flora settles upon the lip and cap. The sanitary significance of the cleanliness and bacterial flora of the bottle cap and top is therefore not to be underestimated.

The scope of this work was to ascertain the extent of possible contamination under various but normal conditions, by the numerical count of organisms on the lips of said bottles as delivered to the consumers. The technique employed was as follows: Cotton swabs were sterilized at dry heat for one hour at 175° C. The original packages of milk were taken from the producers as delivered to consumers. The cotton swabs were moistened in 100 cc. sterile dilution blank and the lip area of the bottle above the cap over which the milk must flow if poured from the bottle, was thoroughly swabbed. These swabs were then emulsified in the dilution blank, and after making suitable dilutions from this blank, agar plates were poured. The technique of this procedure, as well as the counting was carried out according to *Standard Methods of Milk Analysis*, American Public Health Association.

Fifty samples of pasteurized products, representing the maximum condition of safety in sterilizing bottles and handling the product after bottling, were taken in Baltimore, Md. The other 50 were taken in Alexandria, Va., these latter representing the average raw milk supply where the milk was bottled at the place of production, and the sanitary precautions exercised are undoubtedly typical where such conditions govern. The grouped counts per lip are given in Table I (Next page).

From the data tabulated in Table I, it is seen that from a sanitary standpoint the present system of capping milk bottles does not offer complete protection. The significance of these data lies not in the numbers of bacteria found on the lips of the bottle, but in the fact that there is a possible chance that these organisms may be of pathogenic nature.

TABLE I

Counts Per Lip—	Baltimore	Per Cent	Alexandria	Per Cent
Under 1,000	10	20	..	..
1,000- 2,000	6	12	1	2
2,000- 3,000	2	4	0	..
3,000- 4,000	4	8	0	..
4,000- 5,000	2	4	0	..
5,000- 6,000	5	10	0	..
6,000- 7,000	3	6	0	..
7,000- 8,000	1	2	0	..
8,000- 9,000	2	4	0	..
9,000- 10,000	2	4	1	2
10,000- 20,000	4	8	6	12
20,000- 30,000	2	4	4	8
30,000- 40,000	1	2	4	8
40,000- 50,000	1	2	6	12
50,000- 60,000	0	..	1	2
60,000- 70,000	1	2	5	10
70,000- 80,000	1	2	1	2
80,000- 90,000	1	2	3	6
90,000- 100,000	1	2	2	4
100,000- 200,000	1	2	9	18
200,000- 300,000	..	..	..	..
300,000- 400,000	..	..	..	..
400,000- 500,000	..	..	1	2
500,000- 600,000	..	..	2	4
600,000- 700,000	..	..	2	4
700,000- 800,000	..	..	1	2
800,000- 900,000	..	..	0	..
900,000-1,000,000	..	..	0	..
Over 1,000,000	..	..	1	2
	50	100	50	100

Assuming that the bottles have no bacterial growth on their lips when started from the dairy on the way to the consumer, wherein are the sources of contamination and what are the chances of gathering pathogenic micro-organisms from these exterior sources? The most tangible and obvious of these are as follows:

1. THE HANDS OF MILKMEN

Everyone has noticed the careless manner in which the milkman grasps the bottles by the neck, his hands covering the lip of the bottle and depositing upon this lip whatever organisms may be lying upon the surface of the skin. It is possible that this man has been handling horses, dogs, cats or other dusty or dirty objects, which would add to the natural bacterial flora of the skin. It is well known that any of the contagious skin diseases, as well as other communicable diseases may be transmitted in such a manner.

By swabbing a square centimeter of skin on the hands, under ordinary conditions, it was found that such a surface contained between 50 and 100 organisms which grew on agar at 37½° C.

2. THE AIR

Contamination gathered from the air varies according to general sanitary conditions. The carelessness practiced so generally by the milk consumer in allowing the bottle of milk to stay for hours on the doorstep, exposed to floating particles of street dust before removing, enhances the chance of pathogenic organisms being found on the lips of milk bottles. Practically all of our pathogenic bacteria can withstand desiccation for a short time, while others are able to retain their vitality for weeks and months.

In order to get an idea of the number of bacteria gathered from the air under average conditions, the following brief experiment was performed. Bottles were capped and sterilized at 175° C., for one hour and set on a doorstep in a dusty street with the following results, the technique in obtaining these counts being the same as in the original problem.

TABLE II.

1. Bottle (a) after 1 hour—Bacteria per lip of bottle..... 30
   Bottle (b) after 2 hours—Bacteria per lip of bottle..... 40
   Bottle (c) after 3 hours—Bacteria per lip of bottle.....150
2. Bottle (a) after 1 hour—Bacteria per lip of bottle..... 30
   Bottle (b) after 2 hours—Bacteria per lip of bottle..... 50
   Bottle (c) after 3 hours—Bacteria per lip of bottle.....100
3. Inside of Laboratory—
   Bottle (a) after 1 hour—Bacteria per lip of bottle.....200
   Bottle (b) after 2 hours—Bacteria per lip of bottle.....250

3. FLIES

This source of contamination is probably a factor of danger to be considered in this problem. The well known fact that the fly is a transmitter of typhoid and other diseases, and considering the enormous numbers of bacteria carried on his feet and body, make this insect one of the important factors in adding to the

bacterial numerical content on the lips of milk bottles. All persons have observed the swarms of flies hovering over the milk bottle on the doorstep during fly season. Fortunately the anti-fly propaganda has been so far-reaching that this danger is evident, even to the layman.

4. ANIMAL CONTAMINATION

This source of danger—one that must not be underestimated—is due to the fact that animals are well known carriers of contagious diseases. Cats and dogs, both inside and outside of the house, express their fondness for milk by licking the top of the bottle, especially if there be a few drops of milk on the lip or cap of the bottle, which is frequently the case. Who has not seen a stray cat or dog greedily licking the mouth of a milk bottle recently placed on the doorstep in the early morning hours by the busy milkman?

We should account for the greater part of the contamination of the lips of bottles from these sources, at the same time bearing in mind that part of the bacterial flora of the lip came from the milk itself, gathered on the lip during the process of filling the bottles.

PRACTICAL DEDUCTIONS

1. It is evident that from a sanitary standpoint, the present method of delivering and handling of milk in bottles is far from satisfactory. Street dust, dirty hands, animals and careless filling of bottles all contribute to deposit bacteria, some of which may be pathogenic, upon the lip and top of milk bottles.

2. Both the milkman and housewife are at fault. The latter should see that the bottle is brought into the house very soon after being delivered. The top and cap of each bottle should be thoroughly cleansed with a cloth and hot water before the contents are poured out.

3. The bacteria deposited upon the top and cap of a milk bottle stand a chance of being more dangerous than are those found within the bottle.

□

Success and Failure of Attendant Nursing Service.—Public health officials who are endeavoring to find a solution to the problem presented by the shortage of public health nurses will be interested in the results obtained by two communities with attendant nursing service. In Cleveland this service after a trial of more than two years has been abandoned. In Brattleboro, Vt., it is still satisfactory after a period of ten years. In the former city the service was a part of the Visiting Nurse Association and the principal difficulty found there was in the supervision of only partially trained workers so that the work of these attendants would be reliable and not reflect discreditably on the Association. The ability of these attendants to get fees higher than the pay allowed by the Nurses' Association also led many of them to leave, after short and insufficient training, and work independently using the name of the Association as a reference. Brattleboro evidently has not encountered these difficulties. It has on the contrary found its attendants satisfactory.—Thwing, *Public Health Nurse*, April, 1920. (*H. N. C.*)

Typhus Fever in Poland.—One of the worst typhus fever epidemics in the history of the world now threatens Poland, judging by present indications. The report of the American Typhus Fever Expedition says that the Polish Government fully realizes the seriousness of the epidemic which if unchecked will threaten the whole of Europe. This is the fourth year that the epidemic has raged and the present focus appears to be in Russia and Ukrainia. From there it has been spread by refugees, prisoners of war and by infected soldiers sent from the Bolshvik armies into Polish territory. Infection is also spread by the clothing of the dead which is stripped off and carried away to be sold. No one knows the number of cases and the mortality is variously estimated at from 10 to 60 per cent. In order to check the spread of the disease, Poland has purchased nearly four million dollars worth of material used by the A. E. F., including sterilizers, mobile laundries, beds, bedding, 100 tons of soap, bathing plants, trucks and an enormous amount of hundreds of other items.—*Medico-Military Review*, April 15, 1920. (*H. N. C.*)

EDITORIAL SECTION

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SUPERVISION OVER THE MANUFACTURE OF ARSPHENAMINE

The supervision exercised by the Federal Government over the importation of biological products and their sale in interstate traffic is generally understood. The law (July 1, 1902), provides that no viruses, serums, toxins, or analogous products for human administration are to be imported for sale or sold in interstate traffic unless they are manufactured in an establishment holding a license issued by the Treasury Department for the importation or sale in interstate traffic of the particular product. Such licenses can be issued only after an inspection of the plant and an examination of samples of the products. Where there exist assured methods for standardizing biological products, definite requirements as to potency are in force, but in most instances the requirements bear chiefly on questions of preventing contamination. License from the Treasury Department does not place the Government behind the claims of the concern producing a biological product, nor does the Department refuse to license certain preparations the therapeutic value of which is not scientifically determined; on the other hand, licenses are not issued for products which are obviously useless or which are marketed for fraudulent purposes. The act is administered through the U. S. Public Health Service.

Recently a far-reaching opinion was issued by the Solicitor for the Treasury Department, to the effect that arsphenamine (including, of course, salvarsan, neosalvarsan, and the many arsenical preparations allied to these) must be regarded as analogous to viruses, serums and toxins, as understood in the act of July 1, 1902. Therefore, such products cannot be imported for sale or sold in interstate traffic unless manufactured by firms licensed for their importation and interstate sale.

During the war the manufacture of arsphenamine was supervised by the Federal Trade Commission under regulations framed by the Public Health Service. The interpretation just mentioned permits the continuation of such supervision by the Public Health Service, and there is assurance, therefore,

that adequate safeguards will continue to govern the manufacture of these important products. In fact, at the present time, the Treasury Department is issuing a group of regulations for the control of these preparations, the regulations having the approval of the Surgeons General of the Public Health Service, the Army, and the Navy.

There is vital necessity that American arsphenamine be manufactured in an efficient manner and that the toxicity be held to definite standards. Before the war arsenical preparations for the treatment of syphilis were almost exclusively German-made. Today, firms in this country are manufacturing a product which is regarded by the Public Health Service as being equal to, and probably superior to, foreign preparations. The improvement in the quality of the American article is probably in part due to the rigorous standards set by the Government.

As almost all arsphenamine is manufactured for interstate shipment, the product can be almost entirely controlled by the Federal Government under the commerce clause of the Constitution (the basis for the act of July 1, 1902). This is one of the fields where the Federal Government has assumed its definite duties and opportunities. In the case of many of the other products coming under the "biologics" law, a considerable amount of purely intrastate traffic is engaged in. In those cases the States should adopt laws which will reinforce the Federal provisions. This will permit a salutary supervision over a class of preparations which, if manufactured through careless means, could directly cause loss of much life and indirectly discredit one of the most effective known means of disease prevention and cure.

R. B.

TAKE YOUR VACATION IN SAN FRANCISCO

In September the Golden Gate will be a veritable Mecca for sanitarians. Here during the week preceding the meetings of the A. P. H. A. there will be the gatherings of the California Tuberculosis Association and the Southwestern Tuberculosis Conference, while for the week following the visit of the Association there is scheduled the meeting of the International Association of Industrial Accident Boards and Commissions, three almost solid weeks of health discussions.

Attractions like these make it the more advantageous for health officers to take their vacations at the time of the meeting and go to California. In case their time limitations do not permit their traveling on the special A. P. H. A. train with their fellow health workers, or making their stay in San Francisco conform to the precise dates of the Association meetings, there will be these other matters of interest on either side of the principal dates.

The forty-ninth annual meeting of the A. P. H. A. presents unusual attractions like these. There will be the welcome from San Francisco and California, the heartiness of which is proverbial; there will be the visit to states and cities which have established admirable administrations in public health; there will be the presentation by men who have worked in these fields of mixed populations of the problems and the methods whereby the solutions have been sought; and by way of background, there are the picturesque and social features of a visit to "the land of flowers."

The time of the meeting, September 13-17, is drawing near and the different programs have each their attractive features. Energetic and experienced leaders will not be wanting to make the plans successful, but the fundamental essential is the early decision on the part of members as to their individual intentions. Make up your mind now what you intend to do and get into communication with your local Travel Chairman.

BOOKS AND REPORTS REVIEWED

A Laboratory Manual of Physiological Chemistry.—*Elbert W. Rockwood, M. D., Ph. D. Fourth Edition. Philadelphia, F. A. Davis Company, pp. 316. Price, $2.00.*

The first edition of this manual was published in 1899. The author has profited by long observation of the students' reaction toward the book and has developed the text in an interesting way. The procedures, qualitative and quantitative, appear to be up to date and the balance of material is excellent. As stated in the preface, much more is included than is likely to be used in a standard course of instruction. This allows the teacher considerable latitude in choosing the experiments most appropriate to his class. Suggestive questions and valuable references are appended.—*Percy G. Stiles, Ph. D.*

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Syphilis. *Henry M. Hazen, A. B., M. D., St. Louis, Mo., C. V. Mosby Co., 1919, pp. 647. Price, $6.00*

This latest treatise on syphilis as a whole is most excellent. Especially admirable is Dr. Hazen's arrangement in placing the bibliography so conveniently. The illustrations are adequate. Dr. Hazen has associated with himself a number of men who are responsible for various chapters. One of the best of the special articles is that on Syphilis of the Nervous System. Its clearness and freedom from prejudice is noteworthy.

In the chapter on Syphilis of the Eye the author, Dr. L. S. Greene, makes a statement concerning the treatment of interstitial keratitis that is at least open for discussion. He states that arsphenamine has signally failed in the treatment of interstitial keratitis. This is entirely at variance with the belief of many ophthalmologists and syphilographers based on long experience. Given early in the attack of interstitial keratitis arsphenamine is most valuable. Also, Dr. Greene implies, writing as he does on acquired syphilis, that interstitial keratitis occurs commonly in the acquired form of syphilis, when as a matter of fact it is extremely rare.

The concluding chapters on diagnosis, prognosis and treatment are informative and judicial. The knowledge they contain should be spread broadcast as an aid to prophylaxis.

The work is a distinct addition to the textbooks on syphilis—and should be of much help to practitioners as well as medical students.—*(C. M. S.)*

✣

The Transmutation of Bacteria. *S. Gurney-Dixon, M. A., M. D., Cambridge University Press, 1919, pp. 179. Price, $3.25.* This little book is a compilation of the literature available only up to the time of the beginning of the war in 1914. The author apologizes for the shortcomings of the publication in this respect. Certain chapters on viability and agglutination reactions which were meant to be included were destroyed by a shell explosion and could not be replaced. The author deserves credit for his courage in walking off the beaten track and focusing attention upon certain peculiar phenomena with which the bacteriologist is confronted from time to time. A study of the text furnishes a better explanation than could be given in any other way for the difficulty of classifying certain groups of organisms properly. It is evident that practically every character of bacteria is liable to vary at different times and under different conditions. Since there is no absolute criterion as to what constitutes a "species" amongst bacteria, dissimilarity in the several characters they present is the sole guide to classification. The conclusions of the author are of interest. He states that transmutation differs from variation and evolution in degree alone. The occurrence of transmutation between closely allied organisms in the human body is not capable of proof but is suggested by circumstantial evidence. Supposed instances of transmutation brought about by animal inoculation are shown to rest on nonconclusive evidence. The enzyme theory which is discussed in Chapter XI, suggests a means by which bacteria may exchange many of their characters and functions without themselves undergoing transmutation. The evidence is arranged very systematically in twelve chapters. Bacteriologists know how scattered the information pertaining to the subject is and will therefore appreciate this little reference book in their libraries.—*Arthur Lederer, M. D.*

ASSOCIATION NEWS

HEALTH EMPLOYMENT BUREAU

Health officer for the New Jersey Bureau of Venereal Disease Control. Training in public health and law desirable; good personality and ability in public speaking absolutely essential. Initial salary $2,100 with good future. Apply A. J. Casselman, Chief of Bureau, 807 American Mechanic Building, Trenton, N. J.

A qualified school nurse for year around position, salary to begin with $100 per month. Address R. W. G., in care of this Journal

A chemist and sanitary engineer are required by the North Dakota Public Health Laboratories. Salary $2,000 to start. Address A. G. Long, M. D., Grand Forks, N. D.

Bacteriologist. Applications will be considered from trained bacteriologists with view to appointment in large bacteriological laboratory in Massachusetts. Salary $1,500 to $1,800 per annum. Male resident of Boston preferred. Address 355, care of this Journal.

Field Director rural sanitation in Southern state. Salary $2,700 to $2,600 with $800 expense allowance. Address 356, care of this Journal.

CONVENTIONS, CONFERENCES, MEETINGS

June 21-25, Vancouver, B. C., Canadian Public Health Association.

June 21-25, Vancouver, B. C., Canadian Medical Association.

June 21-25, Vancouver, B. C., Canadian Health Officers' Association.

June 21-25, Vancouver, B. C., Canadian National Tuberculosis Association, Vancouver, B. C.

June 21-25, Vancouver, Dominion Committee for Venereal Diseases.

June 21-25, Vancouver, B. C., Dominion Committee for Mental Hygiene.

June 21-25, Vancouver, B. C., British Columbia Hospital Association.

June 21-25, Montreal, Can., American Water Works Association.

June 23-25, St. Paul, Minn., Catholic Hospital Association.

June 24-29, Colorado Springs, Col. American Home Economics Association.

June 25, Lake Tahoe, Nev., Nevada State Medical Association.

June 28, Fairmont, Minn., Southern Minnesota Medical Association.

July —, Regina, Sask., Saskatchewan Medical Association.

July 6, Kentville, N. S., Association of Health Officers of Nova Scotia.

July 12-15, Helena, Mont., Montana State Health Officers' Association.

July 16-17, Seattle, Wash., Washington Health Officers' Association.

August —, Florida State Health Conference.

August 20-21, Denver, Colo., National First Aid and Rescue Contest.

September 9, San Francisco, Cal., California Tuberculosis Association.

September 10-11, San Francisco, Cal., Southwestern Tuberculosis Conference.

September 13-17, San Francisco, American Public Health Association.

September 20-24, San Francisco, Cal., International Association of Accident Boards and Commissioners.

HEALTH WORKERS HEADED FOR SAN FRANCISCO

San Francisco will see an unusual succession of health conferences in September, for no less than four important associations have registered for meetings in that city. To members of the A. P. H. A. the meeting of September 13-17 will be of prime importance, but during the preceding week the California Tuberculosis Association will hold its annual meeting on September 9 and the Southwestern Tuberculosis Conference will meet on Friday and Saturday, September 10-11. On the following Monday the A. P. H. A. will begin its conference running from September 13 till September 17, and from Monday, September 20, till Friday, September 24, the International Association of Accident Boards and Commissions will gather for its meetings. The Northwestern Tuberculosis Conference meets in Cheyenne at the same time that the Southwestern Conference is in session in San Francisco.

REPORT OF COMMITTEE ON SANITATION OF SWIMMING POOLS

Read before the Sanitary Engineering Section, American Public Health Association, at New Orleans, La., October 27, 1919.

The committee on swimming pools begs leave to submit at this time a progress report of work accomplished since the Chicago meeting in December, 1918, at which time this committee was first named.

The amount of detail work incident to the operation, control and engineering design of swimming pools and the consequent significance of each part of the problem has made it impossible, as well as unwise to attempt an investigation of all phases of the problem in one year. The committee has held the opinion that its first work should be general and superficial, setting aside the detail work for another year. It has been deemed advisable this year, to collect and submit data pertaining to the following points and thus emphasize the greater significance of the problem and show why it is a public health matter.

1. The present status of swimming pool control and supervision by state boards of health:

(a) By specific legislation statutes.
(b) By rules and regulations.

2. The present status of swimming pool control and supervision by city boards of health or other city departments.

(a) By specific ordinances.

3. Extent of investigation work conducted by state board of health, city board of health, state and private institutions.

4. Survey of the field of literature and compilation of a bibliography.

5. Preliminary census of swimming pools in the United States with general data concerning many of them.

The significance of swimming pool sanitation, and its relation to the conveyance of certain infections, has previously been pointed out by several investigators. The number of swimming pools in this country, the increasing numbers of people using them and the almost negligible control given them, despite their frequent conveyance of some infections, tend to make the problem an important one.

Letters were sent to each state board of health inquiring into the existence of statutes and rules or regulations for handling swimming pool matters. As a result of this inquiry it was ascertained that only two states possess a specific legislation statute giving the state board of health direct charge and supervision over all swimming pools and requiring pool operators to secure a state board of health permit previous to operation, also requiring the approval of all plans and appurtenances before construction. The two states having such a statute are California and Florida. The latter was successfully passed during the present year. One state, Louisiana, has specific rules and regulations pertaining to swimming pools, adopted by the State Board of Health; of the 48 states, thirteen made no replies to the inquiry, and of the 35 replies received 22 had no rules supervising swimming pools and had done nothing towards getting such supervisory rules. Ten State Boards had made some investigations with a view of later compiling some regulatory measure. Following are states having no rules, regulations or statutes pertaining to swimming pools, and in which no investigations or work of importance have been conducted:

Alabama	North Carolina
Connecticut	North Dakota
Illinois	Ohio
Indiana	Oregon
Kansas	Texas
Georgia	Utah
Maine	Vermont
Mississippi	South Carolina
Missouri	Washington
Montana	West Virginia
New Jersey	Virginia

In Massachusetts, New York, Maryland, Minnesota, Iowa, Wisconsin, Pennsylvania, New Hampshire and Rhode Island, special investigation work has been conducted but no statutes made available as yet.

The survey of the states clearly shows that the sanitation of swimming pools has been greatly neglected and it has not yet been considered seriously as a public health matter of prime importance. It is noted, however, that a tendency is prevailing to make the sanitary control of swimming pools more of a public health measure, and several of the states have expressed a keen desire to promulgate proper regulations; but to date, the problem, practically speaking, has been left untouched by the state boards of health.

Swimming pools in general are located in cities or at resorts near cities. Yet our in-

vestigation clearly indicates that cities have paid little or no attention to swimming pool control or operation. Aside from infrequent bacteriological examination of pool waters by some city boards of health, no work of significance, has been done. Several cities conduct detailed pool examinations at stated periods and thus maintain a control. Only six cities, Fort Smith and Little Rock, Ark.; Cleveland, Ohio; Seattle, Wash.; Appleton, Wis.; Chicago, Ill.; out of 261 cities investigated, state that specific ordinances are available for controlling pool sanitation. In these 261 cities, located in all parts of the country, and replying to our inquiries, there are located in excess of 493 pools.

The committee received data and preliminary information relative to 1,254 pools distributed by states as follows:

Alabama	14	Montana	4
Arizona	3	New Hampshire	6
Arkansas	7	New Jersey	53
California	221	New Mexico	1
Colorado	17	New York	114
Connecticut	31	Nevada	1
Delaware	1	North Carolina	12
Florida	8	North Dakota	4
Georgia	10	Ohio	103
Idaho	4	Oklahoma	11
Illinois	82	Oregon	8
Indiana	42	Pennsylvania	81
Iowa	30	Rhode Island	7
Kansas	13	South Carolina	8
Kentucky	12	South Dakota	3
Louisiana	6	Tennessee	15
Maine	5	Texas	20
Maryland	6	Vermont	2
Massachusetts	70	Virginia	25
Michigan	37	Washington	25
Minnesota	29	West Virginia	7
Mississippi	4	Wisconsin	37
Missouri	35	Washington, D. C.	3
Nebraska	16		

GEORGE W. SIMONS, Jr. Chairman
STEPHEN DE M. GAGE,
J. W. M. BUNKER,
M. C. WHIPPLE.

REPORT OF THE COMMITTEE ON PROBLEMS IN CANNING OPERATIONS

Since our report of a year ago substantial progress has been made in the study of the problems of the canning industry. The record of the progress that has been made in the field is given in a considerable number of articles which have appeared during the year in scientific journals. The articles referred to do not mark the end of the investigations they represent, but rather indicate the increasing volume of work that is being done in the field and will doubtless be followed by other publications.

In addition to the references appended, a considerable number of articles has been published relating to methods for bacteriological work, which are not included because they are of general application. Some articles regarding home canning and home canned foods have also appeared, but are not included as it is understood that the scope of this Committee is limited to the commercial product.

Tin Plate Investigation.—The study of tin plate intended for manufacturing packer's cans has been continued by the National Canners' Association in collaboration with the American Can Company, The Titanium Alloys Manufacturing Company and the National Enameling and Stamping Company. Progress has been made in connection with this work, but much remains to be done. During the last year a new lot of plate has been made, the Committee giving special attention to the manufacture of the steel used for base metal. This plate has been made into cans and typical acid fruits have been sealed into the cans to study the question of pinholing.

Black Patches in Canned Corn.—During recent years the canning industry has been troubled more than at any earlier period by the formation of black patches on the inner surface of corn cans. This matter is being made the subject of intense study both in the laboratory and in the field. The experimental packs that have been put up are now being studied in the laboratory and it will probably be some months before a definite announcement can be made.

Heat Penetration.[1]—During the last year several laboratories have shown an interest in the study of heat penetration in canned foods and have reported different forms of apparatus for its determination. Other forms of apparatus which have been used have not yet been publicly announced. Some of this work has been done in the laboratory, but much of it has been done in commercial canning plants where heat penetration has been studied under various conditions of the commercial canning. The work has been applied to laboratory autoclaves, to the pressure kettle ordinarily employed in commercial canning plants, and to an experimental pressure cooker with which it is possible to determine the heat penetration while the can is being heated at any desired pressure and rotated at any desired speed.

Bacteriological Investigations. — During the last year several laboratories have given attention to the bacteriological flora of canned foods and have made material contribution to the literature of the subject. This work has given us a more comprehensive and more exact knowledge of the particular bacteria to which various forms of spoilage are due. The work is now being extended to the determination of the time necessary at various temperatures and in different foods to destroy resistant bacterial spores to which spoilage due to under-sterilization is occasionally due.

Publications on this subject made during the last year are listed below and it is expected that additional publications will be made in the near future giving the new developments of the work.

Inspection of Canned Foods.—The recently inaugurated inspection service of the National Canners' Association has been described by Mr. Loomis, the head of that service. (*A. J. P. H.*, June, 1920, p. 521.) It should be noted in this connection, however, that there are many research problems which are being worked out in connection with this inspection service. These problems consist partly in the establishment of standards so that a more exact knowledge of the grade and character of the food may be stated on the label in such terms that the consumer may understand it, and partly in a control of the raw product and canning operations which will insure a product of greater uniformity and a higher degree of excellence. The establishment of systematic inspection service makes it possible to work out many such problems to a degree that would be difficult under other conditions.

Study of Food Poisons.—The study of food poisons with special reference to canned foods, which is being conducted under the direction of Dr. M. J. Rosenau of Harvard Medical School, has been mentioned in previous reports of this Committee and was described in some detail in a paper by Dr. Rosenau at an earlier session of this Section. No further mention will, therefore, be made of it here except to say that the investigation is proceeding in a satisfactory manner and much information has already been obtained from it. Eight publications giving results of the work have already been issued and others are either in press or in preparation.

[1]*Bigelow, Bohart and Richardson*—Paper before the Food Division of the American Chemical Society, May, 1919. Unpublished.

Bovie and Bronfenbrenner—Studies on Canning: An apparatus for measuring the rate of heat penetration. *J. Ind. Eng. Chem.* Paper before the Society of American Bacteriologists, Dec. 1918, 1919, *11*, 568-70.

[2]*Bruett*—Utility of blanching in food canning—effect of cold shock upon bacterial death rates. *J. Ind. Eng. Chem.* 1919, *11*, 37-9.

Cheyney—A study of the micro-organisms found in merchantable canned foods. *J. Med. Res.*, Boston, 1919, *40*, 177-197.

Donk—Some organisms causing spoilage in canned foods, with special reference to flat sours. Paper before the Society of American Bacteriologists, Dec. 1918. Published in abstract, *Abs. of Bact.*, 1919, *3*, 4.

Hunter and Thom—An aerobic spore-forming bacillus in canned salmon. *J. Ind. Eng. Chem.* 1919, *11*, 655-7.

Obst—A bacteriological study of sardines. *J. Infect. Dis.*, Chicago, 1919, *24*, 158-169.

Weinzirl—The bacteriology of canned foods. *J. Med. Res.*, Boston, 1919, *39*, 348-413.

WILLARD D. BIGELOW, M. D., Chairman.
C. E. MARSHALL, M. D.,
E. V. MCCOLLUM, M. D.,
PROFESSOR JOHN WEINZIRL,
MR. WILLIAM G. TICE.

Remember the Meeting in San Francisco, September 13-17, 1920.

How about going on the A. P. H. A. Special Train?

How about taking with you your new member?

FINANCIAL DISTRICT

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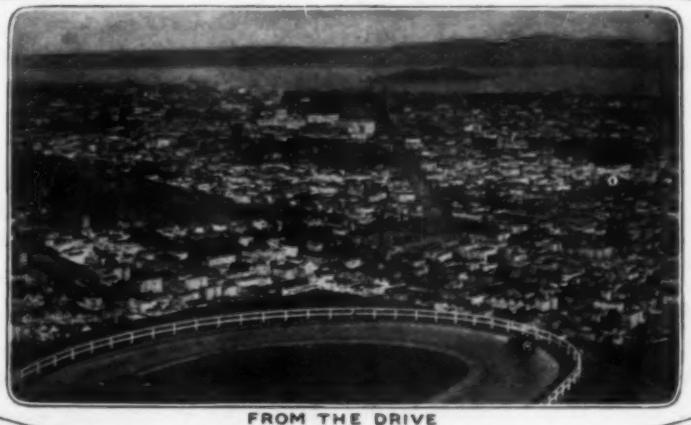
UNION SQUARE



FROM THE DRIVE

SAN FRANCISCO—THE A. P. H. A. CONVENTION CITY

September 13-17, 1920

SAN FRANCISCO MEETING—RAILWAY RATES

In the JOURNAL for May the railway rates from Chicago to San Francisco and return were given (page 479 and page 484). Further figures have since been furnished by the C. & N. W. R. R., applying to other central points east of the Mississippi, as follows:

Albany, N. Y.	$144.05
Atlanta, Ga.	120.50
Boston, Mass.	157.03
Buffalo, N. Y.	126.68
Chicago, Ill.	96.12
Cincinnati, O.	111.28
Cleveland, O.	116.07
Detroit, Mich.	111.99
Indianapolis, Ind	104.22
Jacksonville, Fla.	129.31
Louisville, Ky.	107.69
Montreal, Quebec	149.31
New York, N. Y.	149.08
Philadelphia, Pa.	143.67
Pittsburgh, Pa.	123.42
Richmond, Va.	141.42
Toronto, Ont.	126.95
Washington, D. C.	140.57
New Orleans, La.	96.12*

These rates are for the round trip through Chicago to San Francisco and return, with the journey west of Chicago via Ogden and Salt Lake City in one or both directions. For the same figure the return from San Francisco to Chicago may be made via Los Angeles and thence to Salt Lake City; or Albuquerque or El Paso. For the return from San Francisco to Chicago via Portland, Ore., and Huntington; or via Portland, Seattle, Spokane and Minneapolis; or via Portland, Vancouver and Minneapolis, the price of the round trip ticket will be $19.44 more. This amount should be added to price here given for the local ticket by those who plan to vary their journey by taking one of these routes. War tax is included in these figures.

These fares become effective June 1, and tickets will be on sale daily until September 30, 1920, with the final limit of October 31, 1920, permitting stop-overs at all points en route within that time limit.

Information with reference to special A. P. H. A. trains to the coast is given in the JOURNAL for May, page 479, and reservations should be made through the district travel chairman. For New York, Dr. S. Dana Hubbard, Health Department of the City of New York, will act as travel chairman for the district about that city; members in New England should address Secretary, A. P. H. A., 169 Massachusetts Avenue, Boston 17, Mass., and for the Middle West, Dr. W. A. Evans, 906 Tribune Building, Chicago, Ill., will act as travel chairman, and will be able to give all necessary information.

The Pullman rates from Chicago to San Francisco one way are the following:

Lower berth	$17.01
Upper berth	13.61
Drawing room	60.48
Compartment	48.08

War-tax is included in these rates.

The rate from your home to city of Chicago may be secured from your travel chairman or the local railway agent.

*This is the figure that accompanies the others in the list. It seems desirable to present it although it has not been possible to secure definite information before going to press. It seems not improbable that the rate given is for connection with the through trip to San Francisco at some other point than Chicago. Members in southern cities should therefore verify the rate by enquiry of their local railway agents.

The San Francisco Meeting will be "The Best Ever"

The A. P. H. A. Special from Chicago the Wednesday evening before will be an unusual opportunity for Health Officers to exchange experiences. Secure your reservations for it early. The date of the meeting is September 13-17, 1920.

PUBLIC HEALTH NOTES

Abstracts by D. Greenberg, M. P. Horwood and Mayo Tolman.

Lobar Pneumonia Transmitted to Monkeys.—Previous attempts to transmit pneumonia experimentally to monkeys have either failed or met with only partial success. In no case were the experimental conditions similar to those which exist normally. Recently Blake and Cecil of the Army Medical School, succeeded in producing lobar pneumonia in monkeys, by intratracheal injections of pneumococci. The experiments were conducted with the four types of pneumococci, and it was possible to produce the disease in each case. An 18 hour culture of pneumococci was used in each case, and amounts varying from 0.000001 cc. to 1 cc. were introduced into the lumen of the trachea by means of a sterile needle. Out of 37 monkeys which received inoculations, 32 came down with lobar pneumonia, 2 died of pneumococcus septicemia, and 3 received such small doses that no disease was produced. Attempts to transmit the disease by subcutaneous and intravenous injections and by nose and throat inoculations failed. Symptoms of the disease appeared in from 12 to 36 hours after inoculation. The symptoms in monkeys were very similar to those in man. The temperature curves were similar to those seen in lobar pneumonia in man. Often there was a critical drop in temperature on the seventh to the ninth day. Blood cultures showed varying grades of pneumococcemia, which in non-fatal cases usually disappeared before the crisis, but which in some of the severer cases, increased enormously before death. Pneumococci were found in the blood as early as six hours after inoculation, even before the symptoms of the disease appeared. The organisms apparently penetrate the bronchial wall near the hilum and spread by way of the interstitial tissue and lymphatic system of the lung.

In the less severe cases, there was at first a low leukocyte count. This gradually rose, however, until the blood became free of pneumococci. In severe cases, the leukocyte count at first was increased. This, however, was followed by a fall, which was sometimes very rapid. It was also shown that the disease is spread by contact. Not only can we hope now that prophylactic immunization against the disease will be worked out, but it should also be possible to determine the value of antipneumococcic serums for curing the disease.—*Journal A. M. A.*, April 24, 1920. (*M. P. H.*)

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Higher Standard of Dying.—The post-bellum cry for a higher standard of living has evidently penetrated now to the South African native. At any rate he is agitating for a higher standard of burial. Trouble is reported from Germiston, a Rand mining town, on the occasion of the funeral of three natives killed while cleaning out a municipal tank. The natives were, according to the municipal regulations, to be buried without coffins. Fellow laborers to the number of 200 strongly objected to their being so interred; the funeral was thereupon held up until coffins were obtained.—*London Lancet*, March 27, 1920. (*H. N. C.*)

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Defective Teeth in New York City Schoolchildren.—The *New York Times* for May 2, 1920, reports the findings of the New York Association for Improving the Condition of the Poor resulting from the examination of the teeth of 1,382 schoolchildren. The children examined live on the lower East Side of New York, and varied from 4 to 15 years in age. Of the number examined, 1,334, or 97 per cent, had defective teeth. The total number of cavities found was 9,307, or 6.8 cavities per child. Perhaps the most serious aspect of this dental survey is the vast amount of decay found in the first permanent molars, of which every normal 6 year old child is supposed to have four. This survey is part of the community health plan which the A. I. C. P. started two years ago. It is planned to follow up the survey with prophylactic and curative measures.—(*M. P. H.*)

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Other Public Health Notes are to be found on pages following the Lists of New Members.

State Health Notes, Industrial Hygiene and Public Health Laboratory Notes will be found on page 546 *et seq.*

STATE HEALTH NOTES—LEGISLATION.

National.—A matter of interest to public health workers is the resolution on the distribution of government pamphlets, introduced by Senator Smoot of Utah and passed by the Joint Committee on Printing. The language of the resolution as reported in the Congressional Record of April 2, 1920, is as follows:

"That No person connected with any department of the Government shall furnish any publication for free distribution to any private individual, corporation, or agency in lots to exceed 50 copies without first making application to the Joint Committee on Printing, giving the name of the person or agency desiring the publications, the name of the publication, and the number of copies desired: Provided, That this regulation shall not apply to publications which are sold at a price to cover the cost of same; Provided further, That the clerk of the Joint Committee on Printing be instructed to furnish to each department of the Government and to the Public Printer a copy of this resolution with a request that the receipt of same be duly acknowledged."

The Sheppard-Towner bill or Senate Bill No. 3259, which is now before the Senate Committee on Public Health and National Quarantine provides for national support of maternity and child welfare. It authorizes an annual appropriation of $480,000, $10,000 of which is to be allotted to each state for the establishment and administration of infant and maternal hygiene boards. A Federal Board is provided for, consisting of the Secretary of Labor as Chairman; the Chief of the Children's Bureau, as executive officer; the Surgeon General of the United States Public Health Service, and the United States Commissioner of Education. An additional appropriation of $2,000,000 is authorized for the fiscal year ending June 30, 1921, and increasing about $400,000 annually for five years. This sum is to be apportioned among the states according to population, provided the state appropriates an equal sum.

Other senate bills on public health have previously been discussed in these pages. The France bill S, 2507, to establish a national health department is still in committee.

There are several bills before the House of Representatives which have not previously been mentioned in the JOURNAL. On April 20 H. R. 13229, to establish in the Department of Labor a bureau to be known as the Women's Bureau has been read twice and referred to the Committee on Education and Labor. This bureau is to formulate standards and policies which shall promote the welfare of wage earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment. H. R. 13726 was introduced by Mr. Tilson on April 21 and referred to the Committee on Agriculture. It is a bill to regulate the shipment in interstate commerce of milk and cream, and for other purposes. It requires that no person shall ship such products without a permit from the United States Department of Agriculture. The permit will be issued for one year from January 1st and is revocable for cause. The cattle producing the milk and cream must be physically sound and have reacted negatively to the tuberculin test as prescribed by the United States Bureau of Animal Industry.

H. R. 13526 was introduced by Mr. Baer on April 9th and referred to the Committee on Judiciary. It is a bill to create a National Food Commission, to define its powers and duties, and to stimulate the production, sale, and distribution of live stock, and live stock products, and for other purposes.

H. R. 13677 making appropriations to supply a deficiency in the appropriations for the Federal control of transportation systems and to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1920, contains an item of $7,666,187.14 for the Public Health Service. The need for this sum is given as for medical, surgical and hospital services and supplies for war-risk insurance patients and other beneficiaries of the Public Health Service, including necessary personnel, regular and reserve commissioned officers of the Public Health Service, clerical help in the District of Columbia and elsewhere, maintenance, equipment, leases, fuel, lights, water, printing, freight, transportation and travel, maintenance and operation of passenger motor vehicles and reasonable burial expenses (not exceeding $100 for any patient dying in hospital).—(J. A. T.)

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Hereafter it will be "milk cow" and not "milch cow"—at least so far as the U. S. Department of Agriculture is concerned.

This decision marks the termination of a controversy in which etymologists in the department have had not a little interest. Those defending "milch" have pointed to scriptural use and certain of the classics as establishing precedents, while the opposition has contended that dairymen, ranchmen, and farmers in general use "milk" instead of "milch" almost universally. The advocates of "milk" also favored that word because, they contended, it was more strictly an English word, while "milch" was akin to German. Since Americanization of language as well as ideals is an article in every patriot's creed, it is thought that this last sally of the "milk" defenders helped as much as any to decide the question in their favor.—*Weekly News Letter*, April 21, 1920. —(J. A. T.)

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District of Columbia.—H. R. 13406, introduced by Mr. Mapes at the request of the Commissioner of the District of Columbia, is a bill to regulate the sale of milk, cream and certain milk products within the District. It requires dealers and producers to secure a license from the Health Officer which shall be issued only under certain requirements, including a negative reaction by cattle to the tuberculin test. The milk is graded and containers are required to be labelled according to grading, standards for which are contained in the bill. The penalty for the first violation is a fine of not more than $100 or imprisonment in the workhouse for not more than 30 days, or both, and for any subsequent offense a fine of not more than $500 or imprisonment in the workhouse for not more than one year, or both. The license may also be revoked.—(J. A. T.)

✚

Delaware.—For several months the State Board of Health has been considering a revision of its communicable disease rules, many of which were adopted years ago and are not in harmony with present-day practices. Moreover, many of the existing rules work an unnecessary hardship upon families in which cases of communicable diseases exist. The new regulations were adopted April 1, 1920.

The tabulation of the requirements is set forth in the *Delaware Health News* for April, making a convenient folder for general information. They include for the ordinary diseases: The length of time that the patient must be quarantined, the restrictions that are placed upon well school children and adults, the regulations concerning disinfection, the removal of laundry, milk bottles, etc., from the house while it is quarantined, and general information regarding the incubation period, how the disease is spread and when it is most contagious.

✚

Indiana.—The Indiana State Board of Health at its meeting April 7th passed milk rules, having the force of law, grading milk hereafter sold in the State of Indiana.

Grade A. Raw Milk.—Milk of this grade shall come from cows free from disease as determined by tuberculin tests and physical examinations by a qualified veterinarian, and shall be produced and handled by employes free from disease as determined by medical inspection by a qualified physician, and shall be collected, handled and delivered under sanitary conditions. Dairies from which this supply is obtained shall score at least 80 on the United States Bureau of Animal Industry score card.

Grade AA. Pasteurized Milk.—Milk of this grade shall come from healthy cows and shall be produced and handled under sanitary conditions. The heating apparatus used for this grade of milk must be equipped with an automatic mechanical control device, and with a recording thermometer. The chart from same to be filed daily and subject at all times to inspection of the health authorities

NOTE—Pasteurized milk shall be pasteurized under official supervision. The method shall be heating to a temperature of at least 145° F. —then held for at least 30 minutes and then cooled to 50° F. or lower. To make certain the adequacy of the process of pasteurization, the responsibility rests upon Public Health Officials. Both the "flash" and "holding" methods of pasteurization are permitted if they are scientifically and thoroughly done, as determined by inspection. Dairies from which this supply is obtained shall score at least 65 on the United States Bureau of Animal Industry score card.

Grade B.—Milk of this grade shall be called cooking milk and shall come from healthy cows and shall be produced and handled under sanitary conditions. This grade must be sold in bulk and used only for manufacturing purposes.

These rules when promulgated will have all the force of law and the State Board will enforce them as rigidly as possible.

New Mexico.—At the March 27th meeting, the State Board of Health promulgated amendments to the "Regulations for the Control of Communicable Diseases," requiring the name of cases of venereal disease to be reported where adequate treatment is not continued, and requiring isolation of such cases under conditions where isolation is necessary to protect the public.

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New York.—New York State plans to modify the Public Health Laws. On March 25, 1920, an act was introduced by Mr. Sage in the New York Senate known as Bill No. 1533. The act proposes to amend the public health law, so as to provide for residents of rural districts, for industrial workers and for all others who cannot otherwise secure such benefits, adequate and scientific medical and surgical treatment, hospital and dispensary facilities and nursing care, to assist local medical practitioners, and in general, to improve the health of the inhabitants of the state by authorizing a county, city, or health district to create and maintain one or more health centers, to provide state aid for same, and to make an appropriation therefor.

In more detail, the act provides that health districts shall be established by the board of supervisiors of any county and shall appoint a board of health consisting of five members, at least one of whom shall be a graduate in medicine for at least three years. These members shall receive no remuneration for their services. They shall appoint a district health officer of proper qualifications to serve for six years on a full time basis, at a salary fixed by the District Board of Health. Local boards of health and local health officers who come within the district, shall continue to maintain their organizations and perform their regular duties, except in so far as these may be altered by rulings and ordinances of the District Board of Health. The local health officers shall act as deputy district health officers.

Any county board of supervisors may establish one or more health centers and shall specify the area each is supposed to serve. Under the provisions governing this portion of the act, the board of supervisors may provide as part of the health center, hospital facilities, either through arrangement with existing institutions or by the erection of new hospitals. Such facilities shall include special pavilions for treating tuberculosis and other communicable diseases, for children, maternity cases, for mental diseases and other groups of diseases. Clinics for outpatients, such as maternity, prenatal and child welfare clinics, clinics for tuberculosis and venereal disease, clinics for mental and nervous diseases and defects, clinics for school children, dental clinics, and also general medical, surgical and diagnostic clinics shall be established. In addition provision should be made for clinical, bacteriological, x-ray and chemical laboratories to aid in the diagnosis and treatment of disease. Public health nursing for all parts of the district should be provided. Provision is also made for cooperation with the department of education to secure proper medical supervision and medical inspection for school children, and to assist in providing facilities to treat all school children showing physical defects or disease. Provision is also made for periodical medical examinations of all inhabitants in the district who desire it, and are willing to pay a proper charge therefor. The health center shall also serve as headquarters for all other public health, medical, nursing, and other public welfare agencies of the district that wish to utilize the same.

The bill also specifies the powers of the board of supervisors, among which are the following: To afford a board of managers of the health center which shall consist of seven members, one of whom shall be the county judge ex-officio, two of which shall be physicians, at least one, a woman. The board shall meet at least once each month. Each member shall receive $5.00 for each meeting in addition to his or her travelling expenses. The board shall appoint a properly qualified person as superintendent of health center. The latter may be the district health officer. The board shall also fix the salaries of all employes and exercise general management and control over the health center. The organization of health centers in cities shall be left in the hands of the mayor and other important city officials.

The State is to provide one-half the cost for constructing and equipping hospitals, the cost not to exceed $750 per bed. No State aid is to be given for establishing beds in excess of one to each 500 people in the district. The State is also to provide 75 cents per day for each free patient maintained at the health center hospital. Outpatient clinics are to be

financed to the extent of one-half the cost of establishment, and is not to exceed $5000 per clinic. Free treatments in these clinics are to be financed to the extent of one-half the cost, and is not to exced 25 cents per treatment. One-half the cost of maintaining the laboratories of the health center, not to exceed $3000 per annum for each laboratory is also to be provided by the State. The State is also to provide $1500 towards the initial installation and equipment of such laboratory.

Where the local district has less than 1500 population, the State is to provide 10 cents per capita per annum towards the salaries of the deputy health officer, and 5 cents per capita per annum where the local district has a population from 1500 to 3000. Communities having more than 5000 population shall receive no State aid for more than one health center for every 5000 inhabitants.

The work of all health centers, including hospitals, clinics, laboratories, etc., shall be standardized by the State department of health, and shall be supervised and in many ways controlled by the State Commissioner of Health.

Provision is also made that the State Health Commissioner shall provide for occasional or periodical consultations and clinics at the health centers by specialists in medicine and surgery.—*M. P. H.*

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Ohio.—Regulations known as the Ohio Sanitary Code are to be effective July 1, 1920. On that date all rules and regulations which had formerly been adopted by the State Board of Health or by the Public Health Council are repealed.

The new code contains regulations governing the reporting of notifiable diseases in the state, naming the ailment according to its classification as a dangerous disease, and stating who is responsible for the reporting of it. It includes provisions for notification of such diseases as are found in institutions and for the reporting of deaths from notifiable diseases to the State Department of Health.

The necessary measures for the prevention and control of communicable diseases, such as quarantine, isolation of exposed persons and proper disinfection are embodied in the new code. Regulations for the transportation of the dead and for the inspection and examination of school teachers, janitors and children are also provided.

STATE HEALTH NOTES—GENERAL

California.—The California State Dental Association is active in serving the ever growing need of the public for Dental Education. A Bureau of Information has been established which is in charge of Dr. Guy S. Millberry, Chairman of the Publicity Committee, and Miss Charlotte Greenhood, Executive Secretary. It is the purpose of this Bureau to gather all information relative to dental clinics and will assist every organization endeavoring to establish such. The Bureau will cooperate with child welfare agencies, social service, charitable institutions, Red Cross chapters and health organizations.

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Indiana.—The Indiana State Board of Health, after thorough study of the subject, passed rules having the force of law, governing the production of sanitary milk and sanitary dairy products. The Indiana Dairymen's Association opposed the rules which graded milk and also wanted the score required for the dairies, to be lowered from 75 to 65. Some of the politicians of the state also opposed the rules. The Indiana Manufacturers of Dairy Products favored the rules in every particular. However, the opposition became so great that the promulgation of the rules, which under the law is necessary to put them in force, was postponed. Now letters are coming from the people, advocating the passage of the rules to secure pure milk and thus safeguard the child.

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Illinois.—In its annual budget the Council of the city of Evanston, Ill., has set aside the sum of $4,000 for infant welfare work. About one year ago the movement was initiated, and was financed by popular subscription. Its success was so evident that the city has now taken it over for a portion of the regular work of the Health Department. The development is in the hands of the Health Commissioner, Clarence T. Roome, M. D., and there are established two stations, two full-time nurses and about 500 children are enrolled that are under supervision.

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Iowa.—Workers from specialized tuberculosis and allied health organizations from thirteen Mississippi Valley states will meet at the Hotel Fort Des Moines, Des Moines, Iowa, September 22 to 24. The Conference

program includes general and sectional discussions of health and tuberculosis problems from clinical, sociological, secretarial, nursing, sanatorium, and educational points of view.

Although it is a full program, it is arranged so all may be present at each session of general interest. The Iowa Trudeau Society, the clinical section of the Iowa Tuberculosis Association, is responsible for a series of six demonstration clinics in the early diagnosis of tuberculosis which will be held in conjunction with the Conference program. The clinical programs are also planned particularly for physicians not specializing in tuberculosis. Dr. B. R. Shurly, Detroit, is chairman of this section.

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Kansas.—The Kansas State Department of Health shows considerable activity in its Division of Venereal Diseases. Since July, 1918, more than 3,300 cases of gonorrhea, 1,400 cases of syphilis, and 50 of chancroid have been reported. Treatment has been provided in five clinics and arsphenamine, to a cost of more than $3,600, has been distributed through the clinics and physicians. The laboratory, maintained in connection with the University Medical School has averaged 500 Wassermanns per month since its establishment in January, 1919. Quarantine has been enforced in the two years of 1918 and 1919 on 178 men and 598 women. The number of men showed an increase in 1919, while the number of women quarantined was a reduction of the figure for 1918. An active educational campaign through the use of motion pictures, card exhibits, slides, and the distribution of literature has been conducted.

In Marion County, Kansas, a health survey has just been completed in the rural schools by Dr. J. J. Entz and Miss Cora Gui. Dr. Entz is a member of the State Board of Health and president of important health organizations and Miss Gui was detailed for the work by the American Red Cross. Three thousand seven hundred and four children were examined, 69 per cent of them were found to be underweight, 19 per cent overweight and only 12 per cent normal. The use of milk for a food to a greater extent was suggested and a milk fund was raised to provide this drink for the school children at regular intervals and under supervision five schools undertook the experiment. In one of these the smallest gain in weight was 3 pounds, while one growing boy gained 15. One of the interesting procedures was the drinking of milk out of the bottles through straws.

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Maine.—The first health union to be formed in Maine has just been organized by the towns of Milford, Old Town, Bradley, Orono and Veazie, under the name of the Motbov Health Union. A full time health officer, Major Albert W. Buck of Arland, has just been appointed and a committee of six, two from Old town and one from each of the other towns has been named to conduct the affairs of the Union. The committee consists of E. L. Warren of Old Town, Chairman; C. D. Woods of Orono, secretary; and A. A. Perkins of Old Town, W. G. Colter of Bradley, James Dudley of Veazie, and C. E. Longley of Milford. A salary of $2,400 is paid the health officer. The organization of this health Union is unique in the health history of Maine, for while Portland, Lewiston, Bath, and Auburn, each employs a full time health officer, and the little town of York supports one unassisted except by the state appropriation, this is the first union to be formed.

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Michigan.—Detroit announces the establishment of a clinic for crippled children. This has been sponsored and is being supported by the Sigma Gamma Society of Detroit which will see that children are transported to and from the clinic by motor. The medical and surgical work will be under the direction of Doctors Carrol L. Storey and Nathaniel Ginsberg of the Health Department. The corrective training will be looked after by Miss Marian T. Sweeney, a graduate of Wellesley College, Department of Hygiene. Experience with this type of case, particularly post infantile paralysis, shows that great progress toward complete recovery of weakened limbs is possible by suitable muscular training.

The venereal clinic of the Detroit Department of Health registers a growth in attendance from 685 in January, 1918, to 5,297 in December, 1919. This work now involves the full time attention of one physician, six nurses and one clerk and the part time service of two physicians, one medical student and one nurse.

The "friend" is the most potent single influence in sending people to the clinic. Fifty-

three per cent of males and 24 per cent of females were advised to seek relief from their affliction by friends who had been at the clinic previously. Fourteen per cent are referred to the clinic by private physicians. Twenty-five per cent of positive cases are referred by the clinic to private physicians.

The Detroit Department of Health has just established 28 antitoxin depots in fire and police stations, hospitals and drug stores. A complete equipment of various size doses and also tubes of culture media are maintained and regular collections of culture tubes are made several times during the 24 hours. Physicians now have antitoxin available within a short distance from their office or the case. This plan supersedes the previous one of sending antitoxin out from the main office in answer to each call. The growth of the city has necessitated this change in the distribution system.

The value of chlorine in the treatment of water and the neglect of city officials has been clearly demonstrated in the recent typhoid fever epidemic at Alpena, Mich.

The water supply for this city is obtained from Thunder Bay about 2,000 feet from shore where the water is 16 feet deep and is always dangerously polluted with the city sewage. There was no purification prior to 1913 and the average typhoid death rate from 1900 to 1913 was 44 per 100,000 population. Hypochlorite of lime treatment was begun in February, 1913, but on account of poor supervision did not reduce the typhoid death rate. In October, 1915, a liquid chlorine machine was installed with laboratory control and the average typhoid death rate for 1916, 1917, 1918, and 1919, was 11 per 100,000 population.

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Minnesota.—A number of Public Health agencies in the State of Minnesota, are arranging with the State Fair Board to secure a building in the State Fair grounds to be devoted exclusively to public health.

The Minnesota State Fair is the largest fair of the kind in the country, with an attendance of almost one-half million, and the importance of a concentrated public health exhibit at such an occasion as this, where all the health agencies of the State are represented, should furnish a substantial impetus to the whole movement of public health.

The Minnesota State Board of Health at its April meeting, determined that in its future activities for the control of venereal disease, greater emphasis should be put on the matter of educating the physician. Treatment through clinics and general educational publicity for the laity, have been developed to a considerable extent already. It is the opinion of the Board that the future development of the venereal disease control work in a state so largely rural as Minnesota, must include increasingly greater emphasis on contact with the physicians scattered throughout the small towns in the state, with a view to familiarizing them more thoroughly with the diagnosis and treatment of venereal disease, and the methods and purpose of its control.

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New Jersey.—The principal papers presented at the annual conference of New Jersey state and local health officials, held in Trenton in February last, are to be printed in the successive issues of *Public Health News*, the monthly bulletin of the State Board of Health. A great deal of the present work of the Board is in relationship to the midwives of the state. Supervision of these women is being rapidly accomplished. With its extensive foreign population, New Jersey is not in a position to try to dispense with the midwives, who are advisers to the families as well as obstetrical assistants. The experiment has been tried of combining the association of midwives of two or three counties.

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New York.—The New York County Chapter, American Red Cross, has opened a Bureau of Public Health Information as a part of its Health Service. It is located at the new headquarters of the New York County Chapter, and is for the use of every citizen of New York.

Up-to-date information on public health matters will be given free to all enquirers. The Bureau plans to serve as a central clearing house for the 83 public health agencies in New York County. At the Bureau will be lists of free clinics of all kinds, with information regarding when they are open and how they can be used.

Dr. H. H. Crum, Health Officer of Ithaca, is advocating the establishment in that city

of a convalescent home for children crippled by infantile paralysis. He believes that such a home would be practically self-supporting and would result in the cure or improvement of many children thus affected who otherwise would not receive adequate care and might thus become community charges.

The examination of sanitary conditions at the following New York state institutions has recently been made by the Engineering Division of the State Board of Health, and reports containing recommendations for improvement transmitted to the institution authorities: New York State Hospital for the Care of Crippled and Deformed Children, West Haverstraw, N. Y.; New York State Reformatory for Women, Bedford Hills, N. Y.; Matteawan State Hospital, Beacon, N. Y.; State Homeopathic Hospital, Middletown, N. Y.; Rochester State Hospital, Rochester, N. Y.; New York State Woman's Relief Corps Home, Oxford, N. Y.; State Agricultural and Industrial School, Industry, N. Y.; Binghamton State Hospital, Binghamton, N. Y.

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Ohio.—The Board of Trustees of Ohio State University has appropriated a good salary for a competent woman to take charge of courses in Public Health Nursing and the combined five-year course of Science and Nursing. The position is to be an assistant professorship and will be in the Department of Public Health and Sanitation, which department is on a co-operative basis with the State Department of Health.

The courses will be under the care of Emery R. Hayhurst, M. D., who has been appointed Professor of Hygiene, retaining at the same time his position as Consultant in Industrial Hygiene with the State Department of Health.

According to the definition recently made by the State Commissioner of Health, concerning maternity or lying-in hospitals, any institution admitting maternity cases is now required to obtain a license from the State Department of Health to engage in maternity work.

For a number of years institutions engaged in such work have been licensed, this activity having been limited so far as hospitals are concerned to those institutions engaged exclusively in this work. With the definition of a maternity hospital as given by the Commissioner of Health, that any place receiving women for such care will be known as a maternity hospital, the regulations immediately govern hospitals operated exclusively for maternity cases, a department or ward of a general hospital or a private home used for this purpose.

Five new water filtration plants will be constructed in Ohio in the near future. Contracts will soon be awarded for plants at Defiance and Wauseon. It has been decided to build such plants at Delaware, Greenfield, Eaton and Fremont. Plants at Shelby and Wadsworth are finished and Ashland's is nearing completion.

Results of investigations carried on in various cities over the state to ascertain the reasons for the taste and odors of the drinking water show that the water is not contaminated, but that these arise from natural causes, resulting from the sealing of the river by ice for such a long period during the winter months.

Urging an intelligent use of the budgets which the various counties have appropriated for the carrying on of health work in the state and asking for co-operation among the health commissioners of the different districts, Dr. Allen W. Freeman, Commissioner of the State Department of Health, indicated the general line of work to be carried on in Ohio to 21 new health officials who recently met in conference at the State Department of Health.

"The success of this new plan of health organization in Ohio depends upon you and not upon the State Department of Health," said Dr. Freeman. "It is not physically possible for the Department to do more than cooperate with you. The success or failure of the new plan depends upon the industry, intelligence, diplomacy and application of the men in the various districts."

"You cannot build this thing up rapidly. You cannot build a sound administrative machine up in to or three years, so do not be afraid of making haste slowly. Make your budgets reasonable, that the money may be spent intelligently and get the right sort of personnel for the work. Remember in spending money for public health you buy one and only one commodity, that is brains. In your work it is the quality of the men you hire and the quality of your own mind that makes for success or failure. As you view your job, view it only as a job of getting your own brains and training them on this job," the speaker said in conclusion.

Pennsylvania.—The Medical Division of the Pennsylvania Department of Health has been making some preliminary trials of the Schick test. Sixty-five volunteers in the Department were tested on April 13 and of this number 40, or 62½ per cent, tested positive. All doubtful re-actions, of which there were six, were counted positive.

On April 29 41 tests were made in the Messiah Orphanage, at Grantham, York County. Of these twelve, or 29 per cent, were positive, which includes three doubtful re-actions. In this institution diphtheria had been prevalent during the winter, there having been some 30 cases in a changing population. It is believed the low percentage of positives in this institution was due to a certain amount of immunity from having received antitoxin both for curative and prophylactic purposes. The test was not performed in any persons who had had antitoxin within two months. Toxin-antitoxin mixture is being administered to those re-acting positively who are willing to accept the treatment.

The Department is planning to extend the use of toxin-antitoxin mixture, beginning with institutions such as orphanages and having in mind eventually extending the work to the schools.

For the purpose of preventing the large number of dental defects that occurs in the school children of the Commonwealth, the State Department of Health has instituted a campaign to further the use of dental hygienists in the schools. A concrete ocular demonstration is being made in a number of the larger communities by means of a traveling dental clinic comprised of a dentist and two dental hygienists. The work of the hygienists consists in mechanically cleaning and polishing the surfaces of all the teeth while the dentist supplements the work by extracting and filling such teeth as require treatment. The demonstration is confined to a small group of children usually of the fourth grade. It has been possible by means of this traveling dental clinic to conclusively show local school authorities the practicability of prophylactic dental service in any public school system. The demonstrations have been very successful.

In pursuance of the plan of the State Department of Health to form Health and Morals Committees in every county of the state, and unusually strong, well balanced, sane committee has been formed in Pittsburgh. Tensard DeWolf, Judge of the Morals Court, Allegheny County, chairman of this committee, has succeeded in bringing together a representative group of men and women, each one of whom stands so high in his sphere that the committee is bound to demand the respect of the entire community.

The personnel of the committee is as follows: Tensard DeWolf, (Chairman), Judge of Morals Court; Rev. Thos. F. Coakley, Secretary to the Bishop of the Catholic Church in Pittsburgh diocese; Sherman Conrad, Executive Secretary, Co-operative Welfare Association; J. J. Buchanan, M. D., President Allegheny County Medical Society; H. B. Davis, Ph. D., President Colfax School; Col. Wm. Evans, in charge of the Salvation Army work in four states; Mrs. H. D. W. English; Frank R. Flood, former Captain in the Chemical Service, U. S. Army; Rev. Luther Freeman, Emery Methodist Episcopal Church; W. H. French, Social Welfare Department U. S. Steel Co.; William K. Heck, President Pittsburgh Labor Council; Rev. Ambrose Hering, Secretary of the Lutheran Inter-Mission Society; A. H. Hanauer, Chamber of Commerce; William Frew Long, Manager of the Employers' Association; Miss Grace Lownes, Urban League; Mrs. Enoch Rauh, President Council of Jewish Women; A. W. Thompson, President Philadelphia Company and Edward A. Woods, Manager Equitable Life Assurance Society of the U. S.

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Tennessee.—Demonstrations of malaria control by mosquito eradication are to be made in at least two towns in Tennessee in 1920, the Tennessee State Board of Health, International Health Board, and the U. S. Public Health Service coöperating with the communities in this work. Brownsville has appropriated $1500 and Dyersburg $3000 for the first season's work, these sums to be supplemented by funds from the State Board of Health. Other towns may take up the work.

In addition the coöperative work done in these towns, the city of Memphis has appropriated $10,000, for anti-malaria work within the city limits, and Shelby County $15,000 for work in the suburban sections adjoining the city. This is an important manufacturing district and the officials of the plants are taking great interest in the work.

Texas.—"Local boards of trustees shall make provision for the fumigation of books before the reissue of the books," says the Texas State Free Text Book law.

To determine the most effective method of fumigation, a series of tests was ordered by Dr. C. W. Goddard, State Health Officer, at the request of Miss Annie Webb Blanton, State Superintendent of Education. There will be from six to ten tests made, different concentrations of gas being employed to kill tubercular, diphtheria and other pathogenic germs, placed between the pages of school books, and records of the experiment will automatically show which is most efficient. The result of the information thus obtained will be sent to school boards of the state by the Department of Education as a guide to carry out the requirement of the Free Text Book law.

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Utah.—The State Department of Public Instruction, Division of Health Education, has the past month addressed a health letter to the high school students in the state with reference to taking frequent inventories of their stock of health. The principle upon which this action is based is that in a very short time the high school students will have graduated and be practically dependent on their own responsibility, and they should therefore acquire habits that will in the future prove to be a safeguard to health. These are the questions that the students are given to consider:

1. What is the condition of my hair, my teeth, my eyes, my ears, my nose, my throat, my skin, my stomach, my liver, my heart, my lungs, my kidneys, my bowels, my hands, my feet, my nutrition?

2. Do I want to be attacked by some acute disease before calling for expert help, or do I periodically, say once a year, get that expert help in the way of a scientific examination by one adequately trained for such work?

3. What have I done to rid myself of such remediable physical defects as have been brought to my attention?

4. Have I acquired a set of health habits which will tend to keep me in abounding health and make for my efficiency in life?

5. As I look back upon my school work for the past ten years, is there anything that I have acquired in the way of an education that can be compared in value with a sound body free from defects, full grown, red-blooded, two-fisted, and safeguarded by the possession of the right kind of health habits?

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Virginia.—Virginia cities and towns have already provided or are about to make provision for improved water supplies the eventual cost of which will reach an aggregate of $7,500,000.

Of this sum by far the largest expenditure is that contemplated by Norfolk, the completed program of which for water supply will represent an investment of $6,000,000. For immediate investment for this purpose the city has provided the sum of $1,500,000, and will work out its full program during the next four or five years.

Every water supply made use of by a railway company for furnishing drinking water to its passengers must be certified to twice each year by the State Board of Health. These certificates are forwarded to the United States Public Health Service for approval. When the State Board declines to approve a water supply to the Public Health Service railroad companies are required by law to post notices at their station or stations at the places having the unsafe supply warning their patrons against the use of such water.

Gratifying evidence of the efficacy of rural sanitation work in preventing disease has been recently presented in the report of public health work in Fairfax County conducted under the supervision of E. L. Flanagan, M. D., field director for the State Board of Health, in close coöperation with local authorities and welfare organizations and with the financial backing of these agencies and of the State Board of Health and the International Health Board. Typhoid fever virtually has been wiped out in Fairfax County as a result of the health and sanitation work done in the years of 1918 and 1919.

In 1915 there were 30 cases of this disease reported with 4 deaths, in 1916, 26 cases and 3 deaths, while in 1917 the number of cases reported increased to 48 with 3 deaths. In 1919 there were but 8 cases reported and but one death.

On the eve of the season of high temperatures and increased menace from filth-borne diseases due to the presence of flies, State Health Commissioner Ennion G. Williams has declared that if Virginia would continue to

secure reduction in the incidence of many forms of preventable disease no time should be lost in breaking up every possible breeding place of flies, at the same time making certain the fly-proofing of every toilet. While it is difficult on the farms to avoid furnishing the fly a breeding place in the piles of stable manure it is possible largely to reduce the number of such breeding places, the Commissioner declares, by keeping the manure-spreader busy.

At an enthusiastic meeting last month of the people of Salem and Roanoke counties, Va., held under the joint auspices of the chambers of commerce and the women's clubs, it was decided to take up actively a communal campaign of sanitation. The work has begun by a clean-up week, and by preparations to care for the sanitation of every schoolhouse in the counties. West Point has gone even further, for the town is divided into districts each one with some public spirited organization to look after it, and the effort is being made to have a fly-less, mosquito-less community. Educational work has been undertaken in the schools and the public is notified of the progress by window exhibits and cartoons.

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Wisconsin.—During January, February and March, 1920, 42,793 influenza cases were reported in Wisconsin, and 3,352 deaths from influenza and all forms of pneumonia were recorded, giving a ratio of one death to every 12.7 cases. This proportion is declared to be too high but represents the statewide condition with regard to reporting. Relatively, however, the state ranked high in reporting during the late epidemic.

Tabulations of 1919 mortality by the State Board of Health indicate that deaths from tuberculosis were fewer than in any year in the state's history. These deaths were 82.5 per 100,000 population. In 1908 this rate was 107.7.

Cities and villages in Wisconsin are complying rapidly with the new law requiring provision for public comfort stations. The code on this subject prepared by the State Board of Health is now in the hands of all city officials concerned, and a gratifying response to the demand has been shown by municipalities and the public.

Public health nurses, including county, school, industrial and Red Cross nurses, employed in Wisconsin, assembled at Madison in April for the first state conference called by the Bureau of Public Health Nursing, of which Mrs. Mary P. Morgan is director. A three days' program on all phases of the work gave the movement great impetus.

The State Board of Health has completed the chain of coöperative laboratories of hygiene by establishing one at Beloit, on the southern border. The state now has one central, one branch, and five coöperative laboratories.

Legislation of 1917 reinforced by an act of 1919 have made it obligatory for every city and incorporated village to provide and maintain comfort stations, and rest rooms. The phrasings of the law, definitions and rules and regulations are set forth in a pamphlet issued by the State Board of Health, which presents general plans together with pictures which are of value to municipalities proposing to establish similar conveniences.

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West Virginia.—The Division of Sanitary Engineering of the State Department of Health of West Virginia has issued a pamphlet entitled, *Sanitation in Camp and Country*. It is addressed particularly to the boys and girls who in clubs are accustomed to pass more or less time each summer under canvass or in wooden camps. It is estimated that there are more than 10,000 of such young people to whom such a treatise will be of greatest value. It is hoped that the impression thus conveyed to the boys and girls will be the foundation for bettered understanding of sanitation on the part of the parents.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh, P. M. Holmes, and E. B. Starr.

National Safety Council Committee to Study Dermatoses.—Skin diseases or dermatoses are prevalent among workers in certain industries, and in some cases are caused by or aggravated by the conditions to which the worker is exposed. Such diseases cause a large amount of lost time in many plants, and have received a good deal of attention from industrial physicians, but there is very little accurate information as to their cause and methods of prevention. This led the Health Service Section of the National Safety Council to form a special committee to investigate and report on this subject. This committee consists of three men of the highest standing in the medical and industrial world—Dr. Carey P. McCord, director, Department Industrial Medicine and Public Health, University of Cincinnati; Dr. C. A. Lauffer, medical director, Westinghouse Electric & Manufacturing Company; Dr. C. F. N. Schram, medical director, Fairbanks, Morse & Co.

The report of this committee will be awaited with great interest, for it concerns not only the health of the employe, but the efficiency of the industrial plant.

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Report of the Industrial Conference Called by the President.—This Bulletin of 51 pages, signed by the various members of the President's Industrial Conference, considers among other features the hours of labor and employment of women and children in industry. As a basis it states that the nation is interested fundamentally in the progress and development of the physical, mental and spiritual well-being of its citizens. This well-being must be based upon a body of fact accurately ascertained from experience. If the conditions of an industry do not offer variety and continuing interest the worker should have hours short enough for more recreation and for greater contact with his fellowmen outside of working hours. Study should be made in each industry (preferably by the industry, but in its default, by the appropriate government agency) of the problem of industrial fatigue. In relation to maximum production those schedules which are below the standard must necessarily reduce the total industrial production and consequently reduce the standards of living or increase prices. The Conference believes that some industries are now operating, in part at least, on schedules which have too long hours. There are large basic industries which still employ substantial numbers of men in exhausting work for 84 hours per week and longer. Such conditions are opposed to public interest and are a pregnant cause for industrial and political unrest. A universal standardization of hours is unnecessary and unwise. Undoubtedly there should be provision for one day's rest in seven. Where work is of repetitive nature a schedule of not more than forty-eight hours per week is advised. Overtime should not be permitted except in case of temporary emergency. Further reduction in hours may especially prejudice agricultural communities who already feel the growing competition of the cities in drawing away workers from the farm. For women special provision is needed to keep their hours within reason, to prohibit night employment in factories and workshops, and to exclude them from those trades offering particular dangers to women. Women should not be discriminated against in the matter of equal pay for equal work nor in respect to opportunities for equal training and advancement. The Federal Government has already recognized the unsoundness of permitting the entrance of young children into industry. This matter cannot wisely be left to the sole initiative of the separate states. Differentiation should be made between the various employments which children enter; at the same time, the time of the children should be taken up with their mental and physical development. Over 68 per cent of the 5,516, 163 illiterate persons of over ten years of age in the United States at the last census were native born. Prohibition of child labor and provision for compulsory elementary education are complementary. The ideal solution of the child labor problem is a reasonable uniformity by all the states in their legislation upon these topics. Experience has

demonstrated that the economic interests of the country are best conserved by lengthening the period of education. The Conference proposes joint organization of management and employees as a means of preventing misunderstanding and of securing coöperative effort. Report issued, March 6, 1920, Wm. B. Wilson, Chairman (*U. S. Dept. of Labor,* Washington, D. C.).

✣

Industrial Sanitation in Massachusetts.—New laws in Massachusetts provide that employees who make a substantial change in clothing before working must have lockers. All industrial establishments must provide fresh and pure drinking water to each of their employees and easy of access during working hours. Sections strengthening laws governing compulsory school attendance including evening schools for illiterate minors, the hours of employment of women and children, the moving of heavy receptacles by female employees (75 lbs. or over must be moved with pulleys or castors), and medical chests in mercantile establishments where women or minors are employed are other features. Labor Legislation in Massachusetts 1915-1919, *State Bureau of Statistics,* Boston.

✣

The Removal of Carbon Monoxide from the Breathing Atmosphere.—This article is a summary of investigations on the removal of carbon monoxide from the air which was carried on at the American University Experiment Station established by the Bureau of Mines during the war and supported mainly by funds from the Navy Department. The result is the development and manufacture of a carbon monoxide mask primarily for naval use. While this gas is out of the question for any intentional use as a toxic war gas, yet it is a source of serious danger in marine and land warfare, and, as is well known, in industrial pursuits. The difficulty of removing carbon monoxide from air is its peculiar physical and chemical properties. It is insoluble in almost all solvents at ordinary temperatures. The requirements for a good absorbent are: (1) a quality of high activity in absorbing action and speed, (2) it must be able to act at law temperatures, (3) the amount which can be carried conveniently must have considerable absorbing capacity, (4) the absorbent must offer a low breathing resistance, (5) it must have a considerable chemical and physical stability and be able to withstand long storage, and (6) it should be unaffected by the normal constituents of the air. A large number of absorbents were investigated until finally a combination of mixtures, consisting of the metallic oxides of MnO_2 5 per cent, CuO 30 per cent, Co_3O_3 15 per cent, and Ag_2O 50 per cent was developed and named "hopcalite." This substance practically meets all of the difficulties cited and is capable of practical manufacture. Its action is normally a catalytic one. Each canister through which the air passes must be provided with a drier to remove the moisture from the air before it passes into the hopcalite container. The drier finally recommended is a specially prepared dry, granular calcium chloride. The canister's function depends largely upon the amount of heat produced in the catalytic oxidation of a carbon monoxide air-mixture. A solution of this sulphate is used to control excessive heat production. The life of the canister is limited solely by the life of the drier, hence the gain in weight of the canister due to the absorption of moisture from the air is a criterion of its condition. Any canister which has gained more than 35 grams above the original weight stamped on it should be discarded, as there is then a possibility of more than 0.1 per cent of carbon monoxide gas leaking through it. Lamb, Bray and Frazer, *Jour. of Indus. and Engineering Chem.,* March, 1920, pp. 213-231.

✣

Women in Industry.—The Women in Industry Section of the National Safety Council has, through its Chairman, Miss Copp, elaborated an extensive program which includes a list of the occupations dangerous to women; keeping absenteeism down to a minimum; practical methods of reducing fatigue; specifications of a proper factory chair for women; the limits of weight which a woman should be permitted to lift; time needed for the lunch period; safety and health aspects of night work; first aid rooms; Americanization of women workers; the modifications of process or equipment which will result in greater comfort for employee and greater production; factory uniforms and clothing for women workers and also when and how physical examination of women should be conducted.—*Safety News,* March 8, 1920.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Francis H. Slack, M. D., and Mr. James M. Strang.

Serum Reaction in Bacillary Dysentery; Observations on Agglutination.—McLeod and Ritchie observed the agglutination reactions of sera (1) from the individuals from whose stools dysentery bacilli had been isolated, (2) from normal individuals, (3) from patients possibly suffering from dysentery, but with negative stools. They employed the macroscopic test of Dreyer, utilizing a freshly prepared emulsion of organisms.

In group one, 83 per cent of the sera from the Flexner-Y infections gave agglutination in dilutions of 1/40 or above and only three sera reacted with the Shiga emulsion even in very low dilution. Relatively few Shiga sera were tested, but all studied gave agglutination at 1/30. In group two, only four out of 540 apparently normal men gave agglutination of the Flexner-Y emulsion in dilutions of 1/40 or above, and two of these were proven to have previous histories. About 12 per cent of the doubtful cases in group 3 were shown to aggultinate the Flexner-Y emulsion above 1/40 hence were considered positive.

The authors advocate a standard dilution of 1/30 for Shiga sera and of 1/40 for Flexner-Y, rather than the higher and less satisfactory standards now in use. Freshly prepared emulsions of bacteria are considered to be more specific than those which have stood for some time.—McLeod and Ritchie, *J. Path. & Bact.*, 1920, 23, 217.

✣

Bacteriological Characteristics of Tubercle Bacilli From Different Kinds of Human Tuberculosis.—This paper is one of a series giving the results of investigations of cases of tuberculosis of different kinds with reference to the origin of the organism involved. Special emphasis is here given to cases of scrofulodermia or tuberculosis of the subcutaneous tissues.

Dr. Griffith found that this disease is caused by organisms of both human and bovine types of which the virulence was usually considerably attenuated. At the end of the paper a chart is given tabulating the results of the careful study of 1,068 cases of tuberculosis. The chart shows the number of cases and type of organism concerned in each of several age periods for the different forms of the disease.—A. S. Griffith, *J. Path. & Bact.*, 1920, 23, 129.

✣

Methods of Cultivating Anaerobic Bacteria.—Holker describes a very simple piece of apparatus which consists essentially of a glass arm which may be attached to the vessel containing the cultures and which communicates with a pressure gauge by means of a T-tube and with a suction pump and the gas tap through a two-way stop cock.

By alternately emptying the vessel by the pump and filling it with illuminating gas from the tap, a condition is reached at which the oxygen tension in the vessel is very low and a small amount of relatively unreactive coal gas remains. A special glass-stoppered test tube is figured in which several culture tubes can be incubated anaerobically at once.—J. Holker, *J. Path. & Bact.*, 1920, 23, 192.

✣

Agreement in Results of the Wassermann Reaction.—The blood serums of 3,000 patients were subjected to the Wassermann tests by two independent laboratories. An analysis of the results showed that there was complete uniformity in the findings of the two laboratories in 93.44 per cent. The 6.56 per cent variation included cases reported as doubtful. Considering only the variation of cases reported positive by one laboratory and negative by the other, the percentage variation was 4. This was 1.4 per cent positive in one laboratory and 2.6 per cent positive by the other. Some of these cases were known to be syphilitic so the negative reaction was the incorrect one. Considering then the cases that either laboratory may have reported as positive in non-syphilitic cases the percentage was 3.16. This is probably a higher percentage for false positives than actually occurred, as some of these cases were presumably syphilitic. This percentage variation is based on only one test. Repetitions resulted in a uniformity of findings in the majority of cases.—Harry C. Solomon, M. D., *Jour. A. M. A.*, Mar. 20, 1920, p. 788.

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	Percentage of quota filled
Total	37
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Southern States	44
Atlantic States	29
Central States	31
Canada	17
North Carolina	230
New Mexico	227
Utah	157
California	137
Saskatchewan	133
Maine	104
North Dakota	100
Colorado	92
Rhode Island	91
Montana	91
Nova Scotia	91
Vermont	76
Idaho	75
Connecticut	67
South Dakota	60
Ohio	56
Washington	54
Arkansas	54
Florida	54
Delaware	50
Minnesota	49
Michigan	44
Maryland and D. C.	43
Iowa	42
West Virginia	41
Alabama	40
Oklahoma	38
Wisconsin	36
Massachusetts	34
Tennessee	30
New Jersey	28
Missouri	25
Nebraska	21
New York	21
South Carolina	19
Indiana	18
Kentucky	17
Virginia	16
Kansas	15
Mississippi	15
Illinois	12
Pennsylvania	10

Note: States and provinces are omitted from which appreciable returns have not yet been received.

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Edward S. Godfrey, Jr., New York.
Horace J. Mann, M. D., Brockport.

J. A. Miller, M. D., New York.
Charles L. Dana, M. D., N. Y. Academy of Medicine, New York.
Howard C. Taylor, M. D., New York.
B. Sachs, M. D., New York.

Anna W. Williams, M. D., New York.
Hazel M. Hatfield, M. D., Bacteriologist, Health Dept., New York.

Euthimios H-D. Tchor-Baj-Oglu, M. D., Otisville.
H. Everett Russell, M. D., Health Officer, Otisville.

Harry E. Smith, Oxford.
Mrs. Jesse Jacobs, Oxford.

Helen L. Palliser, M. D., Poughkeepsie.
May L. Reynolds, Commissioner Board of Health, Poughkeepsie.

A. S. Downs, Saratoga.
Harry Loop, M. D., Saratoga Springs.

F. W. Sears, M. D., Syracuse.
Henry G. Meacham, Welfare Worker, Seneca Falls.

C. W. Buckmaster, M. D., Yonkers.
Chauncey V. Umsted, M. D., Deputy Health Officer, Yonkers.

NORTH CAROLINA

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Fairy Rosser, R. N., Public Health Nurse, Statesville.

K. E. Miller, M. D., Raleigh.
John W. Ward, Chairman, County Board of Health, Rowland.
D. S. Curry, M. D., Parkton.
Mrs. Alf McLeod, Lumberton.
Hon. W. R. Surles, Mayor, Proctorsville.

W. S. Rankin, M. D., Raleigh.
Harold Glascock, M. D., Raleigh.
William J. Alexander, City Manager, Gastonia.
J. W. Jones, M. D., County Health Officer, Boone.
William H. Williamson, Raleigh (sustaining member).
P. J. Chester, M. D., Health Officer, Greenville.
Hugo Muench, Jr., M. D., County Health Officer, Windsor.
William E. Warren, M. D., County Physician, Williamston.
William M. Platt, Durham.
A. J. Crowell, M. D., Member, State Board of Health, Charlotte.
Jerrerson Standard Life Ins. Co., Atten. Chas. W. Gold, Treas., Greensboro (corporate membership).
W. A. Bradsher, M. D., Quarantine Officer, Roxboro.
V. F. Couch, M. D., Health Officer, Yadkinville.

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S. W. Hill, M. D., County Health Officer, Regent.
M. G. Flath, M. D., County Health Officer, Stanley.

W. C. McMurtry, M. D., Wolford.
North Dakota Tuber. Sanatorium, Atten. J. G. Lamont, M. D., Supt., Dunseith.

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Arlington Ailes, M. D., Health Commissioner, Sidney.
F. A. Ireton, M. D., District Health Commissioner, Batavia.
W. H. Morgan, M. D., Health Commissioner, Newark.
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W. N. Caldwell, M. D., Health Commissioner, Fostoria.
Minna T. Meyer, Health Commissioner, Columbus.
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Lake County Pub. Health League, Painesville.
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C. J. Loveless, M. D., Health Commissioner, Granville.

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Joseph Blickenoderfer, M. D., Health Commissioner, New Philadelphia.

Frank I. Mayer, Chillicothe.

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Richard A. Feiss, Cleveland.

S. Harold Greene, Boston, Mass.

A. W. Freeman, M. D., Columbus.

C. B. Bliss, M. D., Ohio Pub. Health Assn., Sandusky.

J. Sheldon Scott, Chemist, Water Purification Plant, Steubenville.

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J. M. Woltz, Youngstown.

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Cecelia Conner, Washington Co. Tuber. Assn., Bartlesville.

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D. Armstrong, M. D., Durant.

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J. Angus Gillis, M. D., Frederick.

A. O. Meredith, M. D., County Health Officer, Kingfisher.

George A. Waters, M. D., Public Health Supt., Pawnee.

Harrell Hardy, M. D., County Supt. of Health, Poteau.

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L. B. Laker, M. D., City Health Officer, Eureka.

William H. Rothwell, M. D., City Health Officer, Murray.

J. R. Ward, Chairman, Board of Health, Ogden.

T. J. Howells, M. D., County Physician, Salt Lake City.

R. W. Born, M. D., Health Officer, Sandy.

VERMONT

C. F. Dalton, M. D., Burlington.

John H. Blodgett, M. D., Member, State Med. Society, Bellows Falls.

Warren J. Howard, M. D., District Health Officer, St. Albans.

Victor P. Genge, M. D., District Health Officer, St. Johnsbury.

H. W. Eliot, M. D., District Health Officer, Manchester.

Charles W. Kidder, M. D., District Health Officer, Woodstock.

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Royal F. Clark, Beaver Dam.

C. F. Schram, M. D., Industrial Surgeon, Beloit.

Myra W. Kimball, R. N., Supervisor of Nurses, La Crosse.

Ernest G. Ovitz, M. D., Laona.

Milwaukee Medical Society, Atten. Oscar Lotz, Sec'y, Milwaukee.

Lewis J. Daniels, M. D., Milwaukee.

D. E. W. Wenstrand, M. D., Asst. Med. Dir. N. W. Mutual Life Ins. Co., Madison.

E. J. Campbell, M. D., Oshkosh.

T. F. Thomson, M. D., Milwaukee.

S. L. Pilgrim, Chief, Div. of Food, Milwaukee.

CANADA

C. S. Mahood, M. D., Calgary, Alberta.

W. G. Golding, Milk Inspector, Calgary.

H. V. Graham, M. D., Halifax, N. S.

E. Ada Luxon, R. N., Victorian Order of Nurses, Halifax.

B. F. Royer, M. D., Halifax, N. S.

H. A. Payzant, M. D., Dartmouth.

W. D. Forrest, M. D., County Health Officer, Halifax.

A. G. Nicholls, M. D., Provincial Laboratory, Halifax.

Jessie L. Ross, Chief Nurse, Mass.-Halifax Health Comm., Halifax.

J. A. Doull, M. D., Provincial Inspector of Health, Halifax.

A. C. Jost, M. D., Divisional Health Officer, Guysboro.

Aboriginal Therapy in Europe.—Recently in the pages of the *A. J. P. H.* we were interested to read of Aboriginal Therapy in Africa and accepted the fact that medical science was in a primitive stage among such savage people. It is surprising, however, to read of similar practices being carried on in a European country. Social and religious customs, dense ignorance, superstition and poverty all combine to make the scientific practice of medicine in Albania very difficult. It is hard to realize that this country which has the native land of Aesculapius adjoining it on the south and that of Tippocrates just across the Adriatic should still in these days witness "herb doctors" who surround their widespread practice with all the hocus-pocus of charms, incantations and offerings to the gods. Even the wives and daughters of the so-called cultured classes must depend for treatment on ignorant midwives, for they are not allowed to have male physicians.—*Correspondence, London Lancet,* April 17, 1920. (*H. N. C.*)

✝

The Undernourished Child of the School Age.—Everybody is doubtless familiar with the fact that during the past two years many children have been weighed and measured, and that a large number was considered undernourished. A child was deemed to be undernourished if it was more than 10 per cent below the weight of the average child of its age. Such factors as the nationality or race of the child, the weight at birth, and the stature of the parents were not considered at all. Out of 500 children of the preschool age who were examined according to the former standard, 37 per cent were considered undernourished. But when the latter and more scientific standards were employed, only 7 per cent were considered undernourished.

Some of the causes of malnutrition in children are fatigue, constipation, syphilis, the results of rickets in infancy and the results of early contagious diseases such as measles, whooping cough, diphtheria and scarlet fever. Malnutrition in children is exceedingly easy to prevent, but extremely difficult to cure. One of the best means of prevention is proper feeding during infancy. This determines in a large degree the ehalth and vigor of the child in later years. During the first two years the brain and heart undergo their most important development. Rickets should be prevented since it causes not only anemia and deformities, but pre-disposes to malnutrition and tuberculosis. The best way to prevent malnutrition in the first year is to breast-feed every bady. Out of 5,000 mothers it was found that 88 per cent of all babies can be entirely breast-fed for six months, and 46 per cent can be partially breast-fed for six months. After the first six months, particular attention should be given to the presence of sufficient and proper vitamines and salts in the diet.

Other important factors in preventing malnutrition are to insure an adequate and satisfactory supply of fresh moving air for the infant and child at all times, and an adequate amount of rest, during the day and night.—Julius Levy, M. D., *N. J. Public Health News,* March, 1920. (*M. P. H.*)

✝

Health in Business.—A business man walked into a doctor's office the other day. He looked in the pink of condition.

"I want a thorough physical examination," he said.

The doctor accommodated him. Heart was sound, lungs were healthy, kidneys and all the other organs functioning properly.

"You're the most splendid specimen I've seen in a long time," said the doctor.

"Thanks; I intend to remain so," said the client. "You shall go over me like this every six months. And I propose to have every man in a responsible position in my organization undergo a similar examination twice a year.

"A competing firm recently put a man into an important job who looked as well as I. He broke down, and in the demoralization of the firm's business that came with his breaking, our firm has taken over one of their biggest and best accounts. A condition of twenty years' standing, which he thought completely overcome, caused that man's breakdown.

"I don't propose that my firm shall suffer through any such experience."

Cold, hard business applied to health. Doesn't personal interest recommend to every man such prudence?

How many men can you recall who have discovered a serious state of health too late to mend?—*Haverhill Gazette.*

Australian Maritime Quarantine Against Influenza.—Few countries were in a position to install a complete system of quarantine defence against influenza. The story of how Australia prevented the invasion of the pandemic of 1918 is set forth in the official report of the Director of Quarantine of that country. Vessels presenting a clear record as regards health and contact were not detained. Other vessels were detained for three or more days according to departure from an infected or non-infected port, presence or absence of cases on board, length of period at sea, etc. On detained vessels temperatures were taken daily and inhalation treatment with zinc sulphate was carried out.

That the quarantine system was effective was shown by several things. The immunity persisted until the end of January, 1919. The type of influenza that then became prevalent was much less fatal and of lower infectivity. In Australia the epidemic lasted more than four months, whereas in South Africa and New Zealand it was complete in eight weeks, there being a much higher mortality rate in the latter countries than in the former. There was no evidence that the influenza that appeared in Australia was due to a break through the quarantine. There was good cause, however, for believing that it was produced from the influenza already present in the county during July and August.—*Medical Officer*, March 13, 1920. (*H. N. C.*)

✣

Educating the Rural District in Social Hygiene.—In line with its purpose of bringing health education directly before the people, particularly in remote rural districts, and of co-operating with all existing public health agencies and societies, the American Red Cross has just appropriated $10,000 as a donation to the American Social Hygiene Association to aid that organization in establishing a traveling exhibit on socal hygiene. The exhibit will be mounted on a motor truck and will consist of a motion picture machine with films and slides on social hygiene, a fireproof booth that can be set up in schoolhouses or churches, and large quantities of literature and posters.

The American Social Hygiene Association was formed in 1914 by the union of the American Vigilance Association and the American Federation for Sex Hygiene, and later merged with the New Morrow under the name of the Society of Sanitary and Moral Prophylaxis. During the war, having secured from private sources some half million dollars, it supplemented the governmental efforts in combating venereal disease by coöperating with official agencies that were promoting the campaign in and around military and naval establishments.

✣

Waste in Educating Imperfect Pupils.—"Our schools are wasting nermous sums in trying to educate children handicapped by ill health," so said Dr. Thomas D. Wood, professor of physical education at Columbia University, in talking to 120 of the leading educators of the United States who were assembled at Cleveland not long ago.

"Seventy-five per cent of the 16,000,000 school children of the United States have physical defects which can usually be remedied," he continued, "and the economic loss to the country through this means is a truly staggering total."

✣

Physical Unfitness in Great Britain.—That the United States was not alone in having a high proportion of its men of military age, physically unfit, is shown by a recent report to the British Parliament on the National Service Medical Boards. The medical examination of these boards showed that of every nine men of military age in Great Britain, there were on the average three perfectly fit and healthy; two were upon a definitely infirm plane of health and strength; three were incapable of undergoing more than a very moderate degree of physical exertion and the remaining man was a chronic invalid with a precarious hold on life. Statistical evidence is not available as to whether or not the test of active service bore out these findings. However, more recruits were de-graded than up-graded after they entered the army.

The report also includes investigation in particular places and among special groups, made with a view to determining the influence of occupation, overcrowding and bad hygienic conditions upon health and the incidence of particular diseases. In Yorkshire, agriculturists and miners showed up well while tailors were at the bottom of the list. In London the barbers showed the highest percentage in relation to almost every disease whereas clerks were comparatively healthy.—*Medical Officer.* (*H. N. C.*)

Malaria in the Balkans.—Americans in the Balkans have changed their opinions of the Turk character. They do not blame him now because he appears to be lazy, inefficient and despondent. Wherever he is to be found in Macedonia, Albania, Montenegro, Bosnia, and Herzegovina, his characteristics are the same as those of his Christian neighbors, with whom he lives in greater peace than do the constantly bickering Christian tribes and nascent nations among themselves.

Dr. Regina Flood Keyes, of Buffalo, New York, and American Red Cross physician who has lived in the Balkans for several years and who has been decorated by the French, Greek and Serbian Governments for operations performed under heavy bombardment, attributed the backwardness of the Balkan peoples to two causes, sand-fly fever and malaria.

"The Red Cross fight against typhus, smallpox, cholera and sex diseases in the Balkans attracts much attention in the press," says Dr. Keyes, "but our real work out here is the struggle to down malaria. More British soldiers died or were incapacitated by malaria in the Struma valley during the war than were killed in the taking of the Grande Couronne.

"The whole littoral of the eastern Adriatic from Fiume down to Avlona is a hot bed of malaria and sand-fly fever, while the northern shore of the Aegean from Salonica to Constantinople is even worse. America, if she is going to play her role in the world, must do for the Balkans what she did in the Panama zone. These peoples must be taught drainage, how to kill the mosquito and to maintain domestic sanitation. It is a work of years but we have made a good start in the last thirty months. Malaria causes the all too obvious despondency of the Balkan peoples. To enable them to rise we must kill the mosquito."

✚

Oyster Pollution.—The discovery that oysters in Poole Harbor were contaminated by polluted sea water rather than by sewage from the city of Poole was one of the important results of an investigation of these beds located on the south shore of England near the Isle of Wight. It was recognized for several years that oysters taken from Poole Harbor were contaminated but not until recent studies was it found out that this pollution comes in with the flood tide from the open sea and does not originate within the harbor. It was also observed that the nearer the sea and the more rapid the current the greater was the pollution of the harbor water. After many examinations of water and experimental plantings a spot was found in the harbor perfectly free from pollution.—*Medical Officer*, April 3, 1920. (*H. N. C.*)

✚

Olive Growers to Study Botulism.—The olive growers and canners have raised a sum of money to study botulism. Particular attention will be given to the distribution of *Bacillus botulinus* in nature, the methods by which food materials may become infected with the organism, and the necessary steps required to destroy the organism after raw food materials have been infected. The work will be conducted at the laboratories of the Standard University and the University of California Medical Schools.—*Science*, April 23, 1920. (*M. P. H.*)

✚

An Operation in the Harem.—"I have had many strange experiences as a woman doctor in the Balkans," says Dr. Lulu Hunt Peters, of Los Angeles, who was recently decorated with the order of St. Sava by the Crown Prince of Serbia. "But the oddest operation I ever performed was in Gostivar, Serbia.

"Early one morning a well-dressed Turkish merchant called upon me. He explained that he wished me to operate upon two of his daughters, whom he wished to marry off, and also upon one of his boys. He spoke broken English and good French, but I could not understand what the operations required were.

"Seeing me hesitate, he offered me several valuable rings and bracelets. I assured him, however, that I would be glad to do what I could without compensation. Accordingly, I followed him to his harem.

After some parleying with one of his elderly wives, he finally called forth his daughters. They came from behind a curtain like two automatons, having evidently been kept in waiting there. Both girls upon command raised their veils. At once I saw why they had not married earlier. Both had hare lips. So had the little boy.

"Two days later I performed operations upon the two girls and the little boy, on my day 'off' from Red Cross work.

PUBLIC HEALTH NOTES

FROM FOREIGN LANDS

Translated by Mr. Homer N. Calver

Vaccination Against Tuberculosis.—A remarkable opportunity, which the author states is without precedent in the history of medicine, has been presented to investigate on a large scale the value of a new tuberculosis vaccine. An entire city of 24,000 people, inspired with an absolute confidence in the science of medicine has offered itself as a laboratory. It is not Framingham, Mass., but Alcira, Spain. A famous investigator whose studies cover a period of more than 20 years, is in charge of this massive experiment. The city council bears all of the expense of the work and all the 17 local doctors are happy to assist. A report of the studies made by Dr. J. Ferran on the non-acid-fast bacilli closely related to the bacillus of Koch includes a description of the vaccine used. This contained several strains of non-acid-fast bacilli which the investigator had observed, transformed by passage through animals into organisms resembling the bacillus of Koch; as well as bacilli that had lost their acid-fast characteristics after cultivation *in vitro*.

The entry of Dr. Ferran into Alcira, accompanied by distinguished physicians, professors and journalists is described as almost triumphal. A public meeting was held during which lectures were given on the history of tuberculosis vaccination and experiments in Spain and America. In 8 days 11,788 people of Alcira and 1,952 from adjoining villages had been vaccinated. The great number of outsiders submitting themselves for vaccination promised to complicate the statistics so that operations were suspended for a few days when a second inoculation was given to 9,723 people. Two weeks later a third inoculation was given to 7,601 individuals. In a little over a month 31,264 vaccinations and revaccinations were registered. The author estimates that the total number of inoculations made was in reality nearer 50,000.

The effects of these vaccinations are being carefully watched. Each person in this Spanish Framingham who has been vaccinated has, whether sick or well, his clinical record. The immediate effects were various. Local inflammation was produced in 15 cases. It frequently occurred that about 5¼ hours after the injection there was some discomfort such as fever, headache, sweating, etc. In recognized cases of pulmonary tuberculosis symptoms were generally increased but during the whole series there was not a single death. Nine hundred and fourteen cases of a great many different kinds were given the tuberculosis vaccine and only in two instances were the particular affections exaggerated. The statistical analysis of this experiment is well presented and a clear description of the methods employed is given.

It is too early to judge of the prophylactic value of the vaccine but at later session of the committee it is hoped to present a more detailed report.—Pulido, *Proces-l'erbaux des seances du comitè permenent de l' office. Int. d' Hygiene Pub.*, October, 1919.

✣

Botanical Mosquito Control.—The continued spraying of pools and ponds throughout the mosquito breeding season is often a laborious task. An observer on the island of Corsica noted that stagnant pools covered with a growth of water-lentils, *Lemna minor*, commonly called duckweed, did not contain mosquito wigglers, whereas neighboring pools not so covered contained larvæ of the Anopheles. There was introduced into these pools manure and other decaying organic matter and they were seeded with duckweed. These plants developed rapidly covering the entire surface with the result that the larvæ unable to reach the surface for air disappeared. This seems to offer a valuable and inexpensive method of malaria control.—*Revue Sci.*, March, 1920.

✣

Experimental Trachoma in Rabbits.—The sensibility of rabbits to the virus of trachoma makes the experimental study of the disease more simple. The incubation period in these animals is from 11 to 13 days. The granulation that then takes place lasts at least 60 days. Two different viruses were passed through two different rabbits. In a baboon a typical infection was produced by the virus from one of these.—D'Arsonval, et al., *Revue Sci.*, March, 1920.

✣

Five minutes on the 'phone may do it. Why not call your prospective member now?